AN INVESTIGATION INTO COMPETITIVE PRICING PROCEDURES FOR PROFESSIONAL SERVICES

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ABSTRACT

This research report is an investigation into the Transit New Zealand Competitive Pricing Procedures for professional services. The investigation focuses on the evaluation of the five quality attributes (methodology, track record, technical skills, management skills and relevant experience) used by the tendering authorities to predict the quality of a service.

The investigation consists of the defining of quality and quality concepts as applied to professional engineering services. Based on the quality definition, a review of the prediction of quality through the evaluation of the quality attributes is performed. A literature review of overseas selection procedures for professional services is performed to assist the investigation.

To improve the CPP for professional services this report reviews and develops a performance evaluation procedure. Performance evaluation of the consultant at the completion of a project is for the purpose of providing feedback to the consultant for quality improvement and providing performance records of the consultant to assist in future selections.

Communication plays an important part in ensuring that quality results are achieved. The author investigated communication and the communication process as applied to professional engineering.

Recommendations for improving the evaluation of the quality attributes and improving the client-consultant relationship are presented. Recommended improvements include comprehensive evaluation guidelines, the introduction of explanatory meetings at the RFT stage, and the encouragement of interviews at the evaluation stage. Recommendations for future work includes an investigation into how communication processes can be improved to assist in developing closer, and more open relationships between the client and consultant; relationships that will be mutually beneficial for both parties.

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CHAPTER 1

INTRODUCTION

This chapter consists of a historical review of Transit New Zealand and the Competitive Pricing Procedures (CPP), and a description of the CPP for professional services presented in the Transit New Zealand Manual of Competitive Pricing Procedures, Volume 1 : Physical Works and Professional Services (the manual). The purpose of this historical review and description of the CPP manual is to provide the background information for the investigation of the CPP for professional services, performed in the following chapters. The research report's scope and purpose for investigating the CPPs for professional services is also discussed in this chapter, and a report structure provided.

1.1 THE HISTORY OF TRANSIT NEW ZEALAND

The historical information presented in this section is based on an article by Ted van Geldermalsen (1990).

Until 1989 the National Roads Board of New Zealand planned and administered the maintenance and improvement of state highways, and allocated subsidies to territorial authorities for maintenance and improvement of local roads. The Ministry of Works and Development (MWD) performed the actual work of maintaining state highways and designing and supervising improvements to state highways. All professional services were carried out by the MWD, while improvement works and some major maintenance projects were subjected to competitive tender. Territorial authorities planned and managed the local roads in their area. Most design, supervision, maintenance and improvement work was performed by territorial authority staff. Road safety was the responsibility of the Land Transport Division of the Ministry of Transport, while public passenger transport was administered by the Urban Transport Council.

In 1985 the Government began the process of corporatisation, which included major changes to the way functions in central and local governments were performed. The MWD was separated into policy and commercial divisions . The commercial division became a stand-alone company in 1988, called Works Corporation. The policy division was disbanded and its functions dispersed to other government departments. At this stage the National Roads Board signed agreements with Works Corporation for the corporation to provide all the professional services and to undertake all the maintenance of state highways. However, this changed in May 1989 with the introduction of the Transport Law Reform Bill. The Bill established a new organisation known as Transit New Zealand who would perform the combined functions of the National Roads Board and the Urban Transportation Council. The Bill introduced the requirements that government funds could not be used by Transit New Zealand for any projects of planning, design, supervision, construction or maintenance, or for any public passenger transport project, unless work was awarded by tender to the bidder submitting the lowest price.

Later in 1989 the Transport Law Reform Bill was revised and the new requirements were incorporated into the Transit New Zealand Act (1989), which took effect on 1 October 1989. This revision allowed consideration of other important aspects of contract proposals, such as quality, attention to safety issues and minimisation of long term land transport costs, in addition to the contract bid price. Under the Transit New Zealand Act Section 20 it was required that after 30 June 1991 no payment shall be made by Transit New Zealand unless the payment relates to an approved project, the price of which has been determined by a competitive price procedure. Transit New Zealand are allowed under the Act (Section 19) to stipulate the form of the competitive pricing procedure, however, the following must be considered:

- The effective application of the Land Transport Account;
- The safety and other interests of the public in respect of the project or the class of project;
- The desirability of encouraging competition in the sector of industry likely to supply goods or service in relation to the project or the class of project;

- The undesirability of excluding from competition for the project or the class of project any party might otherwise be willing and able to compete; and,
- The costs of administration associated with the pricing procedure or of any contract formed pursuant thereto.

In June 1990 the Transit New Zealand Manual of Competitive Pricing Procedures for Road Projects including, physical works and professional services was approved. The manual was based on the work of Transit New Zealand (TNZ) staff and KPMG Peat Marwick in association with Works Corporation. As required in the TNZ ACT (1989) all state highway work was contracted out by CPP from July 1991.

In 1992 TNZ commissioned a research project by consultants Barry Butcher and David Coker, to investigate the costs of using CPPs for the letting of contracts for roading professional services (van Geldermalsen and McGeorge, 1995). Following considerable survey work and analysis of tenders the researchers made several findings and recommendations (Butcher and Coker, 1995), some of which were implemented by TNZ. TNZ also undertook to conduct a review in 1992, after CPP had been used for a year; included in the review was the promise of a fundamental review of CPPs. In 1993 a management consultant was appointed to undertake a fundamental review of the CPPs (Hughes, 1995). As a result of these reviews areas for improving the CPPs were identified by TNZ (van Geldermalsen and McGeorge, 1995) and include improvements in scoring of non-price attributes, performance feedback, marketing monitoring and training.

1.2 CPP FOR PROFESSIONAL SERVICES

The purpose of this section is to provide a description of the CPP for professional services presented in the Transit New Zealand Manual of Competitive Pricing Procedures, Volume 1 : Physical Works and Professional Services (the manual). This description will provide the background information for the review of the CPP for professional services, performed in the following chapters.

The first requirement of the manual is the 'tendering authority procedures', which stipulates that as part of its procedures, each tendering authority shall establish a system for recording information in respect of each contract, for TNZ audit purposes. Information recorded includes: the request for tender (RFT), the record of tenders received, and the tender evaluation and recommendations. In addition to this, each tendering authority is expected to maintain a Register of Consultants (unless it advertises every RFT). The authority is required to advertise, no less than annually, invitations for consultants to register or revise their information on the Register. For each contract under the CPP, advice of a RFT must be sent to all consultants registered with that authority to undertake the particular class of work, and/or advertised in appropriate print media.

Table 1.1 sets out the various tender evaluation methods available to tendering authorities for professional services. In addition to these evaluation methods, the Quality-Price Trade Off Method is approved as a provisional variation to the manual on a trial basis. For all of these evaluation methods there are six attributes that should be considered by the tendering authority when evaluating competing tenders, and must be defined in the RFT:

- Relevant Experience;
- Track Record;
- Management Skills;
- Technical Skills;
- Methodology;
- Price.

Chapter 3 of this report defines these attributes according to the manual, as well as reviewing the methods to evaluate these attributes.

The first evaluation method shown in Table 1.1 is the Negotiation Method, which is recommended for projects valued at $15,000 or less. The CPP manual (1993) states that to minimise administration costs associated with such small projects, it is generally appropriate for tendering authorities to approach one or a small number of consultants and negotiate a price.

Table 1.1: Matrix of Selection Methods (CPP, 1993)

PROFESSIONAL SERVICES - METHOD SELECTION MATRIX				
Tender Evaluation		**Contract $ Value**		
		0-15,000	**15-50,000**	**50,000+**
Negotiation Method		✔	✘	✘
Expedited Lowest Price Conforming Tender Method		✔	✔	✘
Weighted Attribute Method	Simplified	✔	✔	✘
	Full	✔	✔	✔
Brooks Law Method	Simplified	✔	✔	✘
	Full	✔	✔	✔

✔= permitted, ✘= not permitted

The second method in Table 1.1, the Lowest Price Conforming Tender Method, is conducted by firstly ranking tenders on price, then determining the tender acceptability when assessed against each non-price attribute. This is done by commencing with the lowest priced tender and ceasing when the first acceptable tender is found. This method may only be used for the following categories of project and only for discrete projects having a contract duration of one year or less (CPP manual, 1993):

i) traffic surveys;

ii) RAMM surveys;

iii) bridge inspections;

iv) design of minor safety works;

v) supervision of minor safety works.

The third evaluation method is the Weighted Attribute Method, the most commonly used evaluation method, under CPP. This method consists of two envelopes; one containing tender information other than price (envelope 1); the other, containing the tender price information only (envelope 2). The first stage of this method is the opening of envelope 1 and the grading of each non-price attribute on a point basis, from 0 (totally inadequate)

to 100 (excellent). Any tender that scores less than 35 on any attribute is excluded from further consideration. The second stage includes the opening of envelope 2 and converting the tender price to a grade using the following formula:

$$Grade = 50 + 100x \frac{\text{Median conforming tender Price - Tender Price}}{\text{Median Conforming Tender Price}}$$

The final stage consists of multiplying the weight of each attribute, as previously stated in the RFT, by the grade of that same attribute and then dividing by 100 to give an index for each attribute. The tendering authority enters into a contract for the tender which scores the highest overall index.

The manual notes for all the evaluation methods, that when assigning weights to the attributes, the tendering authority shall ensure that:

1) all attributes are assigned a weight;
2) all non-price attributes are assigned a minimum weight of 10;
3) the price attribute is assigned a maximum weight of 20 when Weighted Attributes Method is used;
4) the sum of all weights is 100.

The Brook's Law Method consists of two envelopes, envelope 1 and envelope 2 as described above; the evaluation is performed in three stages. Stage one entails opening envelope 1 and assessing tenders against the five non-attributes, as described above for the Weighted Attributes Method. The second stage consists of multiplying the weight of each non-price attribute by the assigned grade and dividing by 100. The third stage involves opening the second envelope (envelope 2) of the tender which scored the highest overall index only. Negotiation is then conducted with the consultant who submitted this tender, to resolve and agree on details of the contract including methodology, the resources to be applied, and an acceptable price. When agreement is reached the second envelope of all unsuccessful tenderers is returned unopened to those tenderers. If agreement cannot be reached with the tenderer whose tender scored the highest overall index, the tender is rejected and the process repeated with the next highest scoring tender.

The final method of tender evaluation of professional services is the provisional Quality-Price Trade Off Method which involves the two envelopes; envelope 1 is evaluated first then envelope 2. The evaluation of envelope 1 is conducted in two stages, the first stage involves assessing tenders against the five non-price attributes, similar to the above methods. Stage two begins by selecting the three highest ranking tenders, then the authority must decide, for the first and second ranked tenders, the maximum additional price over the third ranked tender that would be prepared to pay in order to secure each of these tenders of higher quality. The evaluation of envelope 2 then proceeds, with the opening of envelope 2 of the three highest ranking tenders only. The maximum additional price for each consultant is then subtracted from the actual tender price. The tender with the lowest adjusted price is the preferred tender for entering into a contract.

1.3 PURPOSE AND SCOPE OF THE RESEARCH

The quality of professional services received as a result of the CPP is going to play a major role in assessing whether TNZ is achieving its principal objective, which is:

> ".....to promote policies and allocate resources to achieve a safe and efficient land transport system that maximises national economic and social benefits."

Under CPP it is necessary to predict the quality of a finished product, but to do this there is a need to understand quality and the quality characteristics the product or service should possess. The TNZ CPP for professional services has identified the quality attributes that TNZ believes will accurately predict the finished product of the professional service. How these attributes are evaluated will influence the accuracy of the quality prediction and therefore the quality of the service or product received.

This report begins by defining quality and the quality concepts for professional engineering services, for the purpose of creating the foundation needed to review the quality attributes of CPP. This important step should be taken by everyone involved in the evaluation of quality, however the engineers knowledge of quality is often taken for

granted. Based on the inquiry into quality, the report reviews the prediction of quality through the evaluation of the quality attributes of a professional engineering service. In this review the report considers the need to ensure that through CPP, quality service can be provided by the professional engineer both now and in the future. This can only be achieved if the professional engineer is encouraged to put quality before lowest cost. The report will also review how CPP can be improved to assist in the management of quality, removing some of the responsibility of quality from the consultant to the client.

This report focuses on the procurement of professional services for roading project work, including design, supervision and project management.

1.4 STRUCTURE OF REPORT

CHAPTER 2: AN INQUIRY INTO QUALITY

The many definitions of quality are reviewed in an attempt to define quality for the CPP. Also the discussion and defining of quality concepts, including the management of quality, quality management systems and quality assurance.

CHAPTER 3: QUALITY ATTRIBUTES

This chapter includes a review of the evaluation of the five non-price or quality attributes of CPP. A literature review of the overseas selection procedures for the evaluation of these quality attributes is also performed. Also in this chapter, the report makes recommendations for improving the evaluation and scoring of these attributes under CPP. A discussion of the sixth attribute 'price' and the debate on competitive price bidding is also presented.

CHAPTER 4: PERFORMANCE EVALUATION

This chapter reviews the performance evaluation procedures of New Zealand roading authorities and overseas authorities. Once the review is performed a performance evaluation procedure is developed and recommended for the implementation into the TNZ CPP. The proposed procedure includes a performance evaluation form to be completed by the client and contractor.

CHAPTER 5: COMMUNICATION

Communication, a building block in TQM, can affect the performance, relationships and behaviour of humans. This chapter begins to research the communication process for professional services, recommending methods for improving communication between the client and the consultant under CPP. Future research into effective communication for professional engineers is also recommended in this chapter.

CHAPTER 6: CONCLUSIONS

CHAPTER 2

AN INQUIRY INTO QUALITY

2.1 INTRODUCTION

Quality has emerged as an issue of vital importance in the strategies and plans of organisations. In the coming decade quality is expected to be a major competitive factor in the market place.

Quality has become an important issue for Transit New Zealand (TNZ) which is obligated to ensure the efficient application of national land transport programme funds, including ensuring a quality service. In order to evaluate and ensure the quality of the service delivered, the concepts of quality must be understood. The following inquiry reviews the definitions of quality and discusses the quality concepts for the purpose of establishing the role CPP should play in ensuring quality is achieved from TNZ procedures for the procurement of professional services.

2.2 DEFINING QUALITY

This section reviews the numerous definitions of quality in order to establish the attributes that should be evaluated in the selection procedure for the procurement of professional services.

Many researchers have attempted to define quality so there are many conflicting definitions. As Reeves and Bednar (1994) note,

> "the search for a universal definition of quality has yielded inconsistent results. Such a global definition does not exist; rather, different definitions of quality are appropriate under different circumstances."

A service such as that given by consulting engineers is likely to have a different definition for quality than a company in the production industry; each definition will be appropriate

for their circumstance. Reeves and Bednar (1994) go on to list the various definitions of quality, including; value, conformance to specification, conformance to requirements, fitness for use, loss avoidance, and meeting and/or exceeding customers' expectations.

Zimmerman and Enell (1988) ask the question; 'What is service quality?'. They argue that service firms are all engaged in serving human beings and that the relationship is constructive only if the services respond to the needs of the client with respect to price, delivery time, and suitability for the client's purpose. The extent to which the service successfully satisfy's the needs of the client as it is rendered is called 'fitness for use'. Zimmerman and Enell (1988) state that the basic building blocks of fitness for use are the 'quality characteristics'; the identifiable features or attributes of a service that are needed to achieve fitness for use. There are several sub-features: Psychological, Time-oriented, Contractual, Ethical, and Technological. The service company has to identify the quality characteristics most valued by its clients. To identify these quality characteristics, the client or customer must be identified. Who the customer is, is not always obvious; for example, in a highway design the client may be the roading authority, but it is public funds being spent so the roading authority is ultimately accountable to the public.

Reeves and Bednar (1994) found that while the early definitions and research into quality focused on the quality of the product, little research was spent on the quality of service. However, as a result of the increasingly important role played by services and the inability of researchers to apply traditional manufacturing definitions to service quality, a new conceptualisation of service quality evolved. Only one definition of quality was judged to be appropriate by service scholars and that definition was governed by the extent to which a service met the expectations of customers.

The focus on the customer is supported by Price (1994), who states,

> "the operational definition of quality is 'meeting the customers expectation', provided that the 'customers expectations' which are supposed to be met are clearly and unambiguously understood by the one who sets out to meet them and so provides the 'quality'."

This statement supports the authors concern regarding the importance of communication, a major element of quality management that is given little consideration in many management processes.

The literature review found several definitions of quality by engineers, mostly defined for establishing quality functions suitable for their industry. The American Society for Civil Engineers (ASCE) defines quality in its manual of professional practice titled, 'Quality in the Constructed Project: A guide for Owners, Designers and Constrictors';

> "quality is defined as the totality of features, attributes, and characteristics of facility, product, process, component, service, or workmanship [sic.] that bear on its ability to satisfy a given need: fitness for purpose."

It is usually measured by the degree of conformance to a predetermined standard of performance. The manual goes on to state that in simple terms, quality is meeting the requirements.

Davis, et al (1989) supports the definition of ASCE, stating that in design and construction quality is often defined as "conformance to requirements". Davis et al (1989) notes that the use of this definition has three important effects. First, since the achievement of quality is made an objective, it can be studied in terms of costs. Second, it requires the establishment and careful communication of the requirements from the client to the designer and from the designer to the constructor. Finally, the presence or absence of quality becomes objective, provided the requirements are completely specified. If the requirements are met, quality has been achieved; otherwise, it has not.

The requirements that must be conformed to are influenced by many parties. As ASCE note, under the simple definition of 'meeting the requirements', quality can be characterised as: meeting the requirements of the owner, design professional, constructor, and regulatory agencies (public). In New Zealand under, the Resource Management Act 1991 the requirements of the environment and the Tangata Whenua must also be met. Establishing and meeting the requirements of each of these characteristics is difficult because there will often be conflict between the requirements of the different groups; for example, what the client requires may conflict with the requirements of the regulatory agencies. The role of the professional is to resolve these conflicts and help the customer redefine their requirements.

It is recommended for the CPP for professional services that quality be defined as 'meeting the requirements needed to achieve fitness for use'. This definition allows for

the consideration of the requirements of Transit New Zealand, other authorities, the environment, the Tangata Whenua, the design professional, the constructor and end user. It is important that Transit New Zealand defines and communicates the requirements clearly and unambiguously to the consultant; in some circumstances the consultant will need to assist in establishing these requirements, which will require good communication by both organisations.

2.3 QUALITY CONCEPTS

Once quality has been defined in an organisation it can be used as the basis for developing organisation-wide quality processes and procedures. To achieve quality, an organisation must include in each function the responsibility of carrying out quality activities. The purpose of this section is to define the concepts and activities for achieving a quality service or product.

2.3.1 Management of Quality

In total quality management (TQM), an organisation must realise that every activity in that organisation affects the quality of the product or service, therefore, quality is everybody's job. This belief must become part of an organisation's culture. Oakland (1994), states that

> " TQM is away of managing to improve the effectiveness, efficiency, flexibility and completeness of a business as a whole.....TQM is concerned chiefly with changing attitudes and skills so that the culture of the organisation becomes one of preventing failure and the norm that of operating right first time."

Oakland (1994), goes on to provide the basic building blocks of a TQM model, they are management commitment, communication and organisation culture, these are the soft components of the model. In addition to the soft components, the hard components are:

- A documented quality management system.

- Quality management tools and techniques.
- Teamwork and people.

Juran's (1988) definition of the quality function helps to explain the management of quality. Juran (1988) states that the quality function is in the form of a trilogy, three managerial processes used for managing quality, defined as:

Quality Planning - the activity of developing the products and processes required to meet customer's needs.

Quality Control- this process is used by the operating forces as an aid to meeting the product and process goals.

Quality Improvement- this aims to attain levels of performance which are unprecedented; levels which are significantly better than any past level.

To evaluate the quality management approach of a tenderer, Transit New Zealand's CPP needs to request for and review the quality management processes of the consultancy. And determine whether the consultancy organisational culture and management system is dedicated to TQM. To assist in achieving a quality service, Transit New Zealand must be committed to supporting quality management through its own processes and procedures, including the CPP. How this can be done is discussed in chapter 3 and 4 of this report.

2.3.2 Quality Management Systems

ISO 8402:1986, defines a quality system as 'the organisational structure, responsibilities, procedures, processes, and resources for implementing quality management'.

Oakland, (1994) discusses quality management systems, stating that, consistency can only be achieved if it is ensured that, for every product or each time a service is performed, the same materials, the same equipment, the same methods or procedures are

used every time in the most effective and efficient way. This is the aim of a well-documented quality management system- to provide the 'operator' with consistency and satisfaction in terms of methods, materials and equipment. One must be careful how they interpret this statement by Oakland, as it appears that quality management systems prevent the practice of creativity and implementation of new ideas. However, as previously cited, quality management includes the quality improvement process, which allows for the change. An important part of developing a quality management process is to ensure that the definitions and processes are flexible enough to allow the practice of creativity and the implementation of change, which is important for engineering design.

The ISO 9000 series of standards sets out the methods by which a management system, incorporating all the activities associated with quality, can be implemented in an organisation to ensure that all the specified performance requirements and needs of the customer are fully met. A quality management system is only as good as its implementation and commitment in an organisation. A quality service is not guaranteed just because the consultancy is ISO 9001 certified. The management commitment, communication and the culture of the organisation, which are the soft components of Oakland's (1994) TQM model, will contribute in determining whether a quality product or service is achieved. CPP must evaluate how the ISO 9001 standard is applied by the consultant, and not just be satisfied with the knowledge that the consultant is certified.

2.3.3 Quality Assurance

The ISO 8402: 1986 standard defines quality assurance as, "all those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality."

Oakland (1994), explains quality assurance by noting,

> "when the answer to 'Have we done the job correctly ?' is given indirectly by answering the question on capability and control then quality is assured. The activity of checking becomes one of quality assurance - making certain that the product or service represents the output from an effective system for ensuring capability and control."

Gryna (1988) states that quality assurance is the activity of providing the evidence needed to establish confidence, among all concerned, that the quality function is being effectively performed. He continues on to say that quality assurance provides protection against quality problems through early warnings of trouble ahead. Such early warnings play an important role in the prevention of both internal and external problems. The assurance is provided from objective evidence, but the type of evidence differs widely according to the persons requiring the assurance and the nature of the product.

In the Transit New Zealand CPP for professional services, the evaluation team is required to examine whether the tenderer has a formal quality assurance system and then to evaluate the system. This is an important consideration and Transit New Zealand needs to ensure that the evaluation team understands the concept of quality assurance and to provide a definition in their CPP.

2.4 SUMMARY

The definition for quality varies depending on different circumstances, (Reeves and Bednar, 1994). In the past, quality has focused on the quality of a product, which is not always applicable when a service is provided. Recently, several researchers have defined service quality, most agreeing that it is 'meeting the customers expectations' or similar, (Zimmerman and Enell, 1988; Reeves and Bednar, 1994; Price, 1994). If the definition for service quality is 'meeting the expectations of the customer' then the service company has to identify the quality characteristics most valued by its clients and ensure the expectations of the customer are clearly and unambiguously understood.

The service quality definition can also vary between the different service industries, literature on civil engineering defines quality as 'meeting the requirements' or 'conforming to the requirements' (ASCE, 1988; Davis et al, 1989). Meeting the requirements includes more that just the immediate client, it also includes meeting the requirements of the environment, the regulatory agencies, the constructor, the design professional and the end user. It is recommended for the Transit New Zealand CPP for

professional services that quality be defined as 'meeting the requirements needed to achieve fitness for use'.

To achieve quality in an organisation the people of the organisation must realise that quality is everyone's job. This is the theory behind total quality management (TQM). The basic building blocks of a TQM model are management commitment, communication and organisation culture (Oakland, 1994). According to Juran (1988) there are three management processes for quality management: Quality planning, quality control and quality improvement. In the CPP the evaluation team are required to evaluate the quality management of the tenderers organisation this can be achieved by reviewing these three processes presented in the organisations quality management system.

ISO 9000 sets out the methods by which a management system can be implemented in an organisation. It is important to remember that a quality management system does not ensure quality, quality is affected by the way the quality system is implemented, the organisation culture and the commitment of management.

CHAPTER 3

QUALITY ATTRIBUTES

3.1 INTRODUCTION

Transit New Zealand Competitive Pricing Procedures use six attributes to predict as accurately as possible, the nature and quality of the finished product that would result from each tender. These six attributes are:

- Methodology
- Relevant Experience
- Management Skills
- Technical Skills
- Track Record
- Price

Of the six attributes five are non-price attributes or quality attributes. In most of the evaluation methods, the non-price attributes receive a minimum weighting of 10 for scoring the proposals. Only when the Weighted Attribute Method is used does the price attribute get assigned a weighting; in these cases it has a maximum weight of 20. The sum of all weights must come to 100.

In a paper titled 'Contracting Out Professional Engineering Services in New Zealand' by van Geldermalsen and McGeorge (1995), several areas were identified as requiring improvement, one of which was the scoring of non-price attributes. Van Geldermalsen and McGeorge (1995) state in their paper that, further research is required in the area of scoring non-price attributes. Problems include a very low spread of scores leading to dominance of the price factor, and inconsistencies between different regions. They go on to state that the addressing of this issue is the key to successful operation of the competitive pricing system because:

(a) Correct assessment of quality is essential to achieving the ultimate goal of maximum life time value in projects.

(b) Inconsistent scoring discourages consultants and leads to attempts to " tailor" bids to suit a particular scoring practice.

The purpose of this chapter is to do further research on the scoring of quality attributes. To achieve this, each attribute is independently reviewed and notes are made on the findings, regarding the scoring of each attribute, of the fundamental review on CPP (Hughes, 1995), commissioned by TNZ. A literature review is included and the procedures used overseas to evaluate each attribute are discussed. Recommendations for improving the scoring of each of the attributes are made based on findings from the review of the TNZ CPP for professional services and the literature review. The final section of this chapter reviews the debate on competitive bidding, the consideration of price in the procurement of professional services.

This chapter will focus on ways to improve the guidelines for presenting and evaluating the attributes, rather than on the weighting of the attributes. If the tender evaluation guidelines for the evaluation team are more comprehensive, this may contribute to increasing the degree of variance in scores between the tenderers. Combined with changes in the weighting of the quality attributes and price, the quality-price trade-off may improve.

3.2 METHODOLOGY

In this section the CPP attribute 'methodology' is defined and industry's concerns respecting the evaluation of methodology is discussed. Following this discussion is a literature review of methodology or project approach proposed by the consultant at selection stage. Finally the suggestions and ideas discussed in this section are applied to CPP and recommendations made for improving the evaluation procedure of the quality attribute 'methodology'.

3.2.1 Review of the Competitive Pricing Procedures

CPP Manual for professional services (1993) defines the attribute methodology as, '*the procedures the tenderer proposes to use to achieve the specified end result*'. The manual goes on to comment that under this heading a tenderer is expected to demonstrate their understanding of the project and the clients needs, and the means and methods whereby the desired results can be achieved in a practicable and efficient manner.

An example of how TNZ Regional Offices are applying CPP was reviewed by the researcher at one of the seven Regional Offices. At this office the evaluation of the methodology attribute was performed by breaking the project into critical tasks for scoring. The tasks were given weighting's and were scored on the adequacy of procedures, quality of management system, innovation and added value to client. Critical task breakdown and the scoring attributes were not given to the tenderers. The TNZ Regional Office expects the tenderer to be able to identify the critical tasks and believes giving the tenderer a breakdown of tasks at the RTF stage would result in the proposal being drafted around the tasks.

In a fundamental review of CPP by Hughes (1995) data on quality attribute scoring was obtained from all seven TNZ regional offices. The data, summarised in Table 3.1, covers all projects tendered using the weighted attributes procedures from June 1991 to December 1993. It can be observed that over time a rise in average scores and narrowing of variation between the scores has occurred. Hughes (1995) believes the reason for the convergence of scores is either because of the increasing experience of both parties or by the possibility that tender evaluation teams are not making a price-quality trade-off. Hughes supports this by noting that the widest degree of variance is in the relevant experience, however if a price-quality trade-off was being made one might expect that the greatest differentiation would be made on methodology. Hughes goes on to note that methodology is where firms should be able to translate superior technical knowledge and more experience in the area into alternative approaches which will result in a longer project life, reduced construction costs or even both.

Table 3.1: Average scores and standard deviation (S.D) for all attributes (Hughes, 1995)

Data	Period Ending					
	Jun-91	Dec-91	Jun-92	Dec-92	Jun-93	Dec-93
Average of Relevant Experience	85.32	89.13	88.18	88.08	90.14	89.58
Average of Track Record	63.86	81.13	78.19	77.4	80.51	78.34
Average of Technical Skills	71.76	76.51	79.16	80.36	83.85	80.41
Average of Management Skills	62.29	75.27	77.05	78.68	84.54	79.96
Average of Methodology	68.75	76.1	77.21	80.23	84.47	80.5
Average of Price grade	40.65	43.07	45.05	46.06	47.62	42.28
S.D of Relevant Experience	17.37	14.66	13.51	11.98	8.91	12.14
S.D of Track Record	10.84	13.05	10.1	9.66	10.6	9.38
S.D of Technical Skills	19.76	15.53	11.71	10.82	10.33	10.49
S.D of Management Skills	15.04	15.75	12.25	11.22	9.47	9.65
S.D of Methodology	15.94	13.27	10.26	11.66	8.81	8.97
S.D of Price grade	27.74	40.97	34.47	41.64	29.67	37.39

Van Geldermalsen and McGeorge (1994) summarise the problem as being due to the combination weighting of price and methodology typically being 40%, with the other 60% being by relevant experience, track record, technical skills and management skills. They conclude that this will not result in the preferred trade-off between price and methodology but rather quality is being assessed largely on the basis of experience and qualifications. Another possible reason for the price-quality trade-off not occurring between methodology and price is that superior methodology and innovation is a difficult attribute to evaluate at the procurement stage of a contract. The reason for this difficulty is that the consultant has economic constraints that prevent it for spending considerable time on developing a methodology at a proposal stage. This tends to produce a 'catch 22' situation for TNZ and the consultant, if methodology is going to be the attribute that best differentiates the proposals it needs to be evaluated in some depth. However at the proposal stage this is not possible.

3.2.2 Literature Review

This sub-section reviews the evaluation of methodology in several overseas selection procedures for engineering services. The first evaluation reviewed is from a paper by Kasma (1987). Kasma includes in his list of selection considerations for the services of consultanting engineers, the 'project approach and objectives', which would include the approach to the project work, the familiarity with the project site and the proposed time schedule for completing the work. Kasma (1987), like several other authors (ASCE, 1988; Bryant, 1981; Stanely, 1961), recommends that not only should the consultant be evaluated on the information presented in a written proposal but also for an interview with the evaluation team. During the interview the prospective consultant presents their proposal including their proposed methodology, in more detail and is questioned by the evaluation team regarding the selection considerations mentioned above. Both the interview and the proposal are scored according to the selection considerations.

The British Colombia Ministry of Transportation and Highways Highway Engineering Branch Guidebook (1992), lists methodology as one of the criteria for evaluation in its guide to consulting services. The guidebook defines methodology as the consultant's approach to the project services. This criteria considers the consultant's effectiveness in addressing each phase of the assignment and understanding the Ministry's requirements. The guidebook also notes that when dealing with large, complex assignment, it might be helpful to indicate in the 'Request for Proposals' the desired level of task breakdown and detail the client wishes to receive.

Bryant et al (1982) describes four major factors that are evaluated in qualifying firms for consultancy services, one of which is the firm's concept of the project work. This is indicated by the firms proposed procedure and estimated number of worker-months for accomplishment. Bryant (1982) states that, the consultant must demonstrate that he [sic] thoroughly understands the problem and has developed a project overview. He goes on to suggest that the consultant should provide a detailed workplan, presenting his [sic] evaluation of critical areas and discuss his [sic] approaches and solutions. Also recommended is that the consultant divide the work program into tasks or work

activities that are completely delineated so the client can follow the work schedule from beginning to end.

Bryant (1982) evaluation of the methodology provides the client with five criteria for evaluating this attribute: understanding of problem (quality overview), suitability of methodology (thoroughness of work plan), coverage of all tasks, division of effort by task and discipline, and realistic manpower [sic.] estimate. Bryant fifth criteria, realistic estimate of manpower [sic] would not be, in every circumstance, an indicator of the tenderers understanding or effectiveness of his or her approach. Including this in the criteria should depend on the characteristics of the project, such as its size and complexity. This criteria would be an important indicator for large projects.

Stanley (1961) includes in a list of considerations, for comparing the relative merits of consulting engineers, the consultant's concept of problem. Stanley suggests that clients should ask themselves the question *"Does the consulting engineer display a good understanding of the clients needs and problems?"*. Though Stanely does not go into anymore detail it can be assumed that by asking for a description of the proposed methodology in the RFT, a prospective client can then evaluate the tenderers concept of the problem.

The ASCE (1988) procedures for selecting the design professional pays considerable attention to the design firm's qualifications, rather than their proposed methodology. Consideration of the methodology is briefly mention in the selection process where the ASCE suggests that the prospective client invites chosen design professionals to submit a proposal which should include a plan for performing the work. Following the written proposal is a interview and discussion where the project's objectives and the professional services required and proposed should be discussed; along with the review of qualifications, experience, capability and key personnel. At the end of the interview the selection committee should be satisfied that each firm completely understands the projects requirements.

3.2.3 Recommended Improvements for CPP

Recommendations for improving the selection procedure particularly for the evaluation of the quality attribute 'methodology' are discussed in this sub-section.

To begin with, the tenderer needs to understand the project and the client's needs. This can only be done if the client effectively communicates this in the scope of work. The CPP guidelines states that wherever practicable, tendering authorities should specify end results and should avoid specifying the method to be used. A results approach requires the tendering authority to specify the target outputs to be achieved and it is then up to the tenderer to propose the method to be used to achieve the tendering authority's objectives. This is ideal when trying to encourage superior methodology and innovative ideas; however, it is difficult to achieve in circumstances where the desired outcome is not known, for example in research projects.

CPP specifies the scope of work to be communicated to tenderers in written form, while many overseas procedures consist of a combination of written and oral communication. The oral communication includes inviting a group of consultants (those selected to submit a proposal) to a 'explanatory' meeting a short time after receiving the tender. Kasma (1987) states that such a meeting serves two purposes: 1) it allows the client to present the same information and answers everyone at the same time; and 2) it provides clients with an opportunity to be introduced to the consultants. Explanatory meetings can be expensive particularly if the consultant has to travel some distance to attend, consequently the need for such a meeting should depend on the size and complexity of the job. As Bryant (1981) notes, the cost of preparing the proposal is included in the firm's overhead, which the client must bear in the long run.

It is the authors opinion that the quality of the proposals received, especially the quality of the methodology would only improve as a result of a written and oral presentation of the scope of work. The scope of the work will be more clearly communicated and understood by the consultant. It also ensures that no consultant receives an advantage. Questions directed at the prospective client by phone can unintentionally result in information being given to one tenderer that is passed on to other tenderers.

As part of the consultancy's total quality management, the methodology proposed should be based on the quality processes that form the firms quality plan. For presenting and evaluating purposes this quality attribute should take the form of a project plan, that applies the quality processes. A project plan is job specific and as previously cited the project plan should be divided into tasks or work activities that are completely delineated so the client can follow the work schedule from beginning to end. Each task or activity should describe the problem and the means for achieving the solution.

A more comprehensive guideline in scoring the CPP quality attribute 'methodology' is recommended. Bryant's (1987) scoring criteria for approach and work plan evaluation and those criteria presented in the example from a TNZ Regional Office provide a grounds suitable for establishing the new guidelines. Figure 3.1 below shows an example of the final scoring criteria for the proposed evaluation guidelines. This scoring guideline is based on the provision of a detailed work plan, each activity identified in the work plan may be scored separately to evaluate the consultants ability to understanding the problem, suitability of methodology and level of innovation. Each activity may be given a different weighting depending on the level of technology required to perform the task. When scoring the consultants ability to understand the problem, an evaluation of the quality plan processes and controls for achieving the particular activity should be performed. The evaluation team must keep in mind the quality concepts discussed in chapter two of this report and only score according to the proposals fitness for purpose rather than its strive for excellence.

Van Geldermalsen (1995) suggests that to improve the evaluation of superior methodology and innovation, the performance of the consultant in previous projects in meeting this criteria should be considered. This would require the performance monitoring of consultant and the evaluation of their previous methodology being recorded in a database for future referencing. TNZ currently has no formal performance evaluation programme; however, recommendations are made by the author in Chapter four of this report.

The final criteria shown in figure 3.1, 'quality output' would entail the inclusion in the RTF for the tenderer to specify a future performance result or a 'quality output'.

Examples of this specified 'quality output' is the provision of an estimate of the life costs of the road or an expected accident reduction at a accident site or in a urgent project, an estimate of the construction time of the design. The criteria would be compared with other tenders to determine the score. Under the quality-price trade-off method this quality output would be given a monetary value that could be included in determining the price willing to be paid by the client for high quality service. This criteria is not suitable for every project and places risk on the consultant, future research is recommended before this criteria is included in a RTF.

Points	5	4	3	2	1	Multiplier	Score
Understanding Problem - Quality of Project Plan						x1	
Suitability of Methodology						x1	
Level of Innovation						x0.7	
Coverage of All Tasks						x0.8	
Quality Output Score- as stated in RTF						x0.5	
Key: 5= Excellent, 4= Good, 3= Adequate, 2= Poor, 1= Unsatisfactory.							Total Score (max 20)

Figure 3.1 : Methodology Scoring Criteria

3.2.4 Summary

Currently the trade-off between the quality attribute 'methodology' and price is not being made under CPP. Reasons for this include attribute weighting's and evaluation of the quality attribute 'methodology'. This section reviewed the evaluation of 'methodology' and made several recommendations, the first being the improvement of communication between the client and the tenderers. Overseas procedures include the communication of the scope of works in both oral and written forms; thus, the introduction of 'explanatory meetings' are recommended for CPP. If the scope of work is clearly understood quality and methodology will improve. Also recommended is the process of interviewing at the evaluation stage to provide the client with a chance for questioning the tenderer on their proposals.

A comprehensive scoring guideline is recommended for CPP, which includes the provision of a detailed work plan that will enable the evaluation team to determine if the tenderer has an understanding of the problem, has identified and considered all necessary

tasks to give the required result and has used suitable methodologies. Because of the difficulties in evaluating superior methodology and innovation at the proposal stage, scoring of this criteria should include the consideration of performance in past projects.

The recommendations in this section will help ensure that the evaluation team remains focused on scoring criteria that ensures quality and encourages tenderers to produce creative and innovative solutions.

3.3 RELEVANT EXPERIENCE

In the following section the CPP for professional services attribute 'relevant experience' is defined, and a review regarding the evaluation of this attribute will be discussed. Also included in this section is a literature review on the evaluation of qualifications, focusing on the 'relevant experience' of a consultancy. Finally the suggestions and ideas discussed in this section are applied to CPP and recommendations made for improving the evaluation procedure of 'relevant experience'.

3.3.1 Review of CPP

Relevant Experience is defined in the CPP as; *" the tenders' previous experience in technical areas comparable to this project"*. It goes on to say that this relates more to the tendering company than to the individual (except in the case of newly formed firms). According to the CPP attribute comments, it is necessary to determine whether the tenderer has done the type of work before and how recently. It states that, where the project requires a high level of technology, the experience should be recent and in an area directly comparable with the project. Where a lower level of technology is adequate, other relevant experience may be considered.

As discussed in section 3.2, data obtained from Hughes' (1995) fundamental review (Table 3.1) shows that currently under CPP the widest degree of variance in attribute

scores is for 'relevant experience'. This indicates that relevant experience is having a greater influence than methodology. In Hughes' report is was noted that a number of the consultants interviewed raised the issue of the narrow definition of relevant experience currently used by some TNZ tender evaluation teams in evaluating tenders. This may be resulting in the evaluation teams emphasising the need for experience in technical areas comparable with the project when the project has a low level of technology. This type of evaluation may prevent in the less experienced consultancies from winning tenders resulting in a reduction in competition.

Competition is a concern because without competition TNZ can not meet their obligations under the TNZ Act (1989). If 'relevant experience' is having the greatest influence in the quality-price trade-off, then the larger companies with the most experience, like Works Consultancy Services, will continue to win tenders, and not necessarily be providing a quality service. Concern about the competition under CPP is reviewed in the fundamental review of CPP (Hughes, 1995), which noted that Works Consultancy Services in December 1993 had 56% of work tendered under CPP. Seventeen companies, including Works Consultancy Services, have bid consistently for TNZ work; of the seventeen only nine have a win ratio greater than 10%. It is doubtful that a firm with a win ratio of 10% or less will stay in the market long term.

A project example reviewed by the author at a TNZ Regional Office showed that for the evaluation of this attribute the project was divided into critical tasks. Then the tenderer was evaluated according to their technical experience, magnitude of experience, and when it gained the experience applicable to the particular task. The winning proposal for this project provided a general discussion of their consultancy experience but did not give detailed dates and project names for reviewing. One assumes that this would only occur when the tenderer is well known to the Regional Office, and such details were not necessary.

3.3.2 Literature Review

In the ASCE (1988) procedures for selecting the design professional, the qualifications including experience, of the prospective design professional are the

primary factor of consideration. Written qualifications submitted by design professionals are evaluated by the selection committee. A file of 'statements of qualifications' for firms engaged in various types of professional design services is held by many federal government agencies and large industry corporations. The type of information ASCE (1988) suggests should be included in a statement of qualifications is illustrated in Figure 3.2. Following the receipt of proposals, tenderers are invited to meet with the selection committee for separate interviews and discussions. During the interviews the selection committee, as well as several other things, will review the qualifications and experience of each firm. ASCE's emphasis on qualifications rather than methodology does not encourage innovation or superior methodology and the details required in the 'statement of qualifications' has the potential of disadvantaging new firms.

First name:
Year established:
Former firm names:
Business address:
Telephone:
Type of services particularly qualified to perform:
Names of principals of firm and where registered:
Names of key personnel, with experience of each and years of membership in organisation, and identification under such specialised headings as :

Civil Engineers	Planners- Site, City,	Environmental Engineers
Structural Engineers	Community	Geotechnical Engineers
Mechanical Engineers	Others	Surveyors
HVAC Engineers	Architects	Design Professionals
Industrial Engineers	Transportation Engineers	CADD Designers

Maximum number of staff at any one time:
Outside consultants and associates usually employed and the qualifications of their key personnel:
Completed similar work on which you were the Design Professional of Record:
Present activities:
Number of projects:
Estimated construction cost:
Completed similar design work on which you were associated with others:
(Constructed- yes or no)
Present activities on which you are associated with others:
Estimated annual capacity, in dollars:
Average annual volume of workload in last five years, in dollars:
Largest project in last five years;
Largest current job:
Approximate square feet of office space:
Financial capability:
Banking reference:
Signature, with date of submission:

Figure 3.2: Statement of Qualification for Consulting Design Firms (ASCE, 1988)

Kasma (1987) includes in his list of selection considerations for the services of consultanting engineers 'technical experience', which is defined as *'general experience of the firm and experience in the specific project or tasks to be done'*. To obtain information on the consultant and their experience, Kasma (1987) recommends that the

letter inviting consultants to submit proposals include a questionnaire on the engineering firm. The questionnaire requires similar information to the ASCE (1988) 'statement of qualifications' presented in Figure 3.2.

Bryant (1982) suggests two forms of qualifications statements. The first is the criteria for the client to rate the consultant's basic qualifications. Included in the basic qualifications is the consultants financial capacity, reputation, and experience in environmental evaluation, the type of project under consideration, master planning and in design of projects similar to the one under consideration. This criteria is assessed and then rated, any category being rated 'non-acceptable' results in automatic disqualification of the consultant from further consideration. With the use of this qualification statement Bryant notes that the consultant must establish that his [sic] firm regularly engages in consulting work - thereby eliminating firms lacking the required expertise or experience. As with the ASCE (1988) and Kasma (1987) qualification statements, new consultants can be disadvantaged because of the emphasis on financial capability and experience. This criteria may work against the client in the future as new firms means greater competition.

The second qualification statement Bryant (1982) presents is a more detailed qualification statement for the specific type of project envisaged. This qualification statement is submitted by the consultant as part of their proposal, and it is not evaluated if the first qualification statement is disqualified. It requires the rating of specific tasks and specialised projects according to the experience and expertise of the tenderer. Bryant (1982) states that each item or task must be covered adequately - either by written technological submission, or through oral interview.

Napleton (1994) warns the future users of compulsory competitive tendering (UK equivalent to CPP) that all consultants produce glossy information on their past projects. This can give a broad idea of their specialisation but one has to determine the age of their projects and whether they still retain the senior staff who actually carried out the work. The qualification statements presented by ASCE (1988), Kasma (1987) and Bryant (1982) can determine this information, as well as Napleton's suggestion that the evaluation team personally contact former recent clients of the tenderers and utilise their own personal knowledge and experience they have with the consultants.

3.3.3 Recommended Improvements to CPP

It is recommended that the definition for 'relevant experience' remain as it is however a greater emphasis should be given to the comments in the CPP guidelines for the evaluation of this attribute (Appendix E of the CPP Manual and Guidelines). It is important to emphasis that when a new company is being evaluated, the individuals personal experience should be considered and where the necessary level of technology lowers, then the other relevant experience may be considered. These conditions should be applied by the evaluation team wherever possible to ensure that competition remains.

It is recommended for future research that TNZ consider the British Columbia R.I.S.P System which includes selection priorities. Two of the selection priorities are where firms with the lowest pending proposal count are stack ordered; those with the lowest or zero are selected first. And firms are categorised based upon the date of most recent project award, thus those firms that have not been successful in obtaining Ministry projects and those firms that have not been awarded through RISP program for extended periods of time are place higher on the selection listing than those firms that have been recently awarded Ministry projects. These selection priorities and the RISP system are applied early on in the selection process for short listing consultancies to invite to offer a request for tender (RFT) or for small projects (less than $100,000) the selection of one qualified firm to offer the request for tender (RFT).

3.3.4 Summary

If relevant experience remains the greatest influence in the quality-price trade-off in CPP there is a chance that competition will decrease. It is recommended that more attention be paid to comments made in the CPP guidelines when evaluating the relevant experience of new companies and projects that require a low level of technology. It is important to address the concern that some TNZ tender evaluation teams are using a narrow definition of relevant experience. However, it is important to remember that the reason that relevant experience is being the greatest influence is because the other quality attributes have a low degree of variance in their scores, possibly due to poor evaluation.

Attention must also remain on improving the evaluation of the other quality attributes in an attempt to increase the variance between the scores of all quality attributes.

Most overseas examples reviewed in this section emphasis the need for experience and financial capacity. While this is important in large projects with high risk it is a disadvantage for the less expensive projects requiring less financial stability, experience and expertise. The procedures reviewed made little allowance for newer companies, however several considered the experience of personnel and associate companies. Compared with New Zealand competition is a lot stronger in overseas countries where there are larger companies and many of them have experience all over the world. It is for this reason that not all the criteria in these overseas selection procedures are suited to New Zealand's current environment.

Competition in New Zealand may be improved by encouraging new companies into the market by offering them a greater opportunity to win tenders. The British Columbia Ministry of Transportation and Highways uses a computerised system called RISP to assist in selecting consultants for small projects and invitation-only tenders. Priority is given to those companies who have not recently received work from the Ministry and those who have a low count of winning tenders. Meeting these priorities doesn't guarantee the consultancy work (it still must meet other criteria similar to CPP) but what it does is give the consultancy the chance to prove their capabilities in a more balanced environment. It is recommended that TNZ review the RISP system for future implementation into their CPP.

3.4 MANAGEMENT SKILLS

In this section the CPP attribute 'management skills' is defined and a review of the evaluation of this quality attribute under CPP is discussed. Following this is a literature review on the evaluation of tenderer qualifications particularly management skills in procedures used overseas. Finally the suggestions and ideas discussed in this section will be applied to CPP and recommendations made for improving the evaluation procedure of the quality attribute 'management skills'.

3.4.1 CPP Review

The quality attribute 'management skills' is defined in the CPP manual as *" the availability within the tenderer's organisation of personnel with appropriate management skills together with effective management* systems and methods appropriate to the successful management of the project". This definition is further explained in the 'comments' section, which states that two factors should be examined:

i) The relevance of the management skills and experience of the management personnel offered.

ii) The tenderer's management system for properly controlling the project, particularly its quality, cost and timing, and whether the company has a formal quality assurance system.

Evaluating the quality attribute 'management skills' requires an understanding of quality, quality management and quality assurance systems. The CPP manual does not define these concepts, and assumes that the evaluation teams of the roading authorities understand these concepts. This type of assumption can be dangerous as there is a lot of confusion regarding the definition of quality (Walls, 1995) and related concepts.

A TNZ Regional Office visited by the author evaluated a consultancy's management skills according to the systems, people, commitment and backup for project management, achievement of objectives, contract management, financial management, regulations and public relations. This appears to be a very comprehensive evaluation however the management systems were not well presented in the proposals received. The winning proposal discussed how the quality system will benefit and ensure quality; however, it did not provide any processes demonstrating the quality assurance system of their consultancy. The information accepted by the TNZ office lacked any depth, which resulted in a low degree of variance between the different proposal scores. It is this type of poor evaluation that causes small variances in average scores for the quality attributes, as evident in Table 3.1 of this report.

3.4.2 Literature Review

Many overseas selection procedures discuss the management skills and approach in an interview with the consultant, (ASCE, 1988; Bryant, 1982; Kasma 1987), as well as asking for information in the written proposal. Kasma (1987) provides a list of questions to be asked during the interview with the prospective consultant, some of which relate to the management approach; these questions are shown in Appendix A of this report. This type of communication allows the client to gain a greater understanding of the systems by questioning and allowing the consultants to explain their approach. It also allows the client to question the consultancy on the calibre and commitment of the management personnel assigned to the project. Unfortunately, the TNZ CPP discourages the use of interviews, stating

> "while interviews are permitted during tender evaluation, they should only be for the purpose of clarification of material contained in the tender. However, where possible, such clarification is best obtained by writing to the tenderer in question."

Bryant (1982) proposes that as part of the approach and work plan (refer to section 3.2) the consultant should identify all disciplines required to undertake the project. After this the client, utilising the submitted curricula vitae, should ensure that the consultant has proposed competent personnel to manage each discipline. This is an important consideration as many firms compromise on the provision of superior management staff when providing a competitive bid. A consultancy may try to lower the price of their service by allocating a less expensive and less qualified management staff to the project. In other cases the consultancy bids on such a low price that they compensate by substituting the quoted management staff during the project with less qualified, cheaper personnel or by reducing the time spent by the management personnel on the project.

The British Columbia Ministry of Transportation and Highways include in its criteria for evaluating proposals several management considerations:

i) Scheduling- The proposed time (duration), effort (working time) and sequence of work for each phase of the assignment.

ii) Organisation- The consultant's proposed organisational structure for the assignment indicating the roles, responsibilities and reporting relationships of technical and supervisory personnel.

iii) Cost Control- Any proposed features to minimise costs on the assignment such as opportunities to reduce travel costs etc.

Also obtained during the selection processes is the curricula vitae of key personnel including management. The BC Ministry of Transportation and Highway also recommend consultant interviewing when the proposals are very close. The guidebook (1992) states that this practice is extremely useful when you are looking for individuals with a level of proficiency in specialised skills. The information in the proposal cannot provide you with proof of proficiency.

3.4.3 Recommended Improvements for CPP

As discussed in chapter 2 of this report, there are three management processes that form the quality function: quality planning, quality control and quality improvement. The purpose of this quality attribute under CPP is to evaluate the consultancies quality planning and quality control processes. To achieve this the consultant must be required to present evidence of these quality management processes both orally and in writing. Defining of the quality concepts in the CPP is recommended, and should include definitions for quality, quality management and quality assurance. Also recommended is improved communication to the consultant on what information is required in regard to the 'management skills' attribute. There is a need for detailed information on quality systems if a accurate evaluation is going to be achieved.

If interviewing was introduced into the CPP selection process it would allow the consultancies to explain more clearly their quality management processes and allow the evaluation team to determine the overall attitude of a consultancy toward quality management. Interviewing will allow the evaluation team to question the consultancy on their commitment to providing skilled management personnel.

Recommended for the purpose of evaluating the management personnel, is the review of the personnel's past performance, particularly the project manager. This would require the performance evaluation of the project manager to be included in the performance evaluation process discussed in chapter four of this report.

3.4.4 Summary

Evaluation of the 'management skill' attribute requires an understanding of quality and quality concepts. There is evidence to suggest that this attribute is not being accurately evaluated because of the lack of information on a consultants quality processes, in tender proposals. A request for greater information on the quality system is recommended, as well as the defining of quality concepts in the CPP.

Many overseas procedures evaluate the consultant on their written proposal and response during an interviews. Including interviews in the selection process of CPP has been recommended in previous sections (section 3.2). However, additional reasons supporting this argument includes: it would allow the client to determine, by questioning, the attitude of the consultancy toward quality and their commitment to providing adequate management personnel. Also recommended is the inclusion of the performance evaluation of the project manager in the proposed performance evaluation procedure for CPP.

3.5 TECHNICAL SKILLS

The CPP for professional services quality attribute 'technical skills' is defined and a review regarding the evaluation of this attribute are discussed in the following section. Also included in this section is a literature review on the evaluation of the tenderer's qualifications, focusing on the 'technical skills' of consultancy's key personnel. Finally the suggestions and ideas discussed in this section are applied to CPP and recommendations made for improving the evaluation procedure of the quality attribute 'technical skills'.

3.5.1 Review of CPP

The CPP manual defines the attribute 'technical skills' as *" the competence of the personnel that the tenderer proposes to use with particular regard to their skills and experience in technical areas comparable to the project"*. Comments regarding this attribute note that it is necessary to determine the technical skills required for the project and to assess whether the qualifications and experience of the personnel proposed can provide it. It is also stated for this attribute as well as the 'management skills' attribute that, having proposed personnel with certain skills as an attribute of their tender, tenderers should be compelled to employ these people on the contract and only replace them with mutually acceptable alternative personnel.

When reviewing the scoring of this attribute under CPP (Hughes, 1995), it can be seen from Table 3.1 (section 3.2) that the variance in scores has decreased substantially over time. This may be due to the increase in experience with CPP, of both the client and the tenderer and also the increasingly competitive environment which offers a high standard of technical skills.

Hughes (1995) notes, when reviewing the quality-price trade-off issue, several consultants suggested in interviews with the researchers that some tender evaluation teams do not score on the basis of need, or appropriateness for the job, but rather continue to add more points for higher qualifications, bigger teams or more experience beyond the point at which they truly adding value to the particular project. This type of criticism may have arisen because of the evaluation team's lack of understanding regarding the concept of quality and fitness for purpose.

The TNZ Regional Office reviewed by the author evaluated this attribute by considering the relevant quality and training, experience, commitment, focus and availability of personnel to achieve technical tasks identified as critical by the evaluation team. Consideration of the training received by the key personnel is an important part of ensuring quality, though it is not identified in the CPP manual. Continuing eduction allows the engineer to be aware and able to apply new technology to solving solutions effectively.

3.5.2 Literature Review

Bryant (1982) provides a qualifying criteria for personnel, which consists of rating the education, pertinent experience and developing nations experience of the personnel allocated to the various tasks. Bryant also addresses personnel concerns in the criteria for rating consultant's basic qualifications, stating that there are several concerns that should be addressed regarding key personnel, including asking the questions: are they members of the permanent staff of the consultant? or are they all brought in from outside to accomplish the tasks? Bryant argues that for senior posts, permanent staff personnel are imperative.

Kasma (1987) suggests staffing, including the availability of adequate personnel, equipment and facilities to do the needed work, should be considered in the evaluation process, as well as the name of the individuals to be assigned to the project with particular attention to their qualifications, competence and service with that firm. The B.C Ministry of Transportation & Highways (1992) also requires the quality and quantity of resources available to the consultant, including specialised equipment, computer hardware and software, technical support staff and administrative support staff, along with the names, qualifications and experience of the key personnel the consultant will be assigning to the work.

The ASCE (1988) sample of information required in statement of qualifications for consulting design firms (section 3.3), includes the requirement for information on personnel employed, including outside consultants and associates usually employed. The required information includes the names of key personnel, with experience of each and years of membership in the organisation and their identification under specialised headings such as, Civil Engineers, Planners, and Structural Engineers. ASCE state in their selection procedure that the consultancy should be able to assign or make provision for qualified staff to the project and be able to complete required services within the time allocated.

Many selection procedures (Kasma, 1987; Bryant, 1982; Stanely, 1961; ASCE, 1988; BC Trans. & Hwys., 1992) researched suggest that the technical skills should be verified

during interviews with the tenderers. Implementing a interview stage in the selection process of the CPP has been recommended previously in this chapter; the benefits of this would include the verification of technical skills and overall staff commitment.

3.5.3 Recommended Improvements to CPP

It is recommended for the purpose of evaluating the technical skills of the proposed key personnel, that the individuals should be assigned to the tasks identified in the project plan (discussed in section 3.2). With the provision of curricula vitae on the key personnel, the evaluation team can evaluate whether the key personnel are capable of achieving their assigned tasks to the required quality. Consideration of relevant and recent training may also assist in the evaluation of the technical skills offered by the tenderer.

To score this quality attribute the evaluation team should score each task by the quality and qualifications of the personnel assigned to it. A greater weighting maybe given to the score for more difficult tasks where technical expertise will play a major role in achieving the required result. Also recommended for assisting in scoring of the overall commitment of the tenderer in providing qualified and skilled staff is data on the past performance of the consultant. This can be achieved by including the evaluation of this attribute in the performance evaluation procedure discussed in chapter 4 of this report.

3.5.4 Summary

The variance in scores of the quality attribute has decreased substantially over time. Concerns from consultants include the belief that some evaluation teams are not scoring technical skills on the basis of need, but rather, scoring beyond a level where they are truly adding value to the project.

It is recommended that to assist the evaluation team in determining the technical skills required for the project the tenderer should identify the tasks from the project plan that the individual person will be assigned to. Scoring may be weighted depending on the

level of skill required to achieve a task. This scoring technique plus the overall weighting assigned to the attribute 'technical skills' will address the concerns of consultants.

Verification of technical skills during interviews with tenderers is common practice in overseas selection procedures and is recommended for the TNZ CPP. Also recommended is the consideration of the consultants past performance in providing skilled staff, including the key personnel previously agreed to in the tender.

3.6 TRACK RECORD

In the following section the CPP for professional services quality attribute, 'track record' is defined and a review regarding the evaluation of this attribute are discussed. Included in this section is a literature review on the evaluation of consultant performance. Finally recommendations from the suggestions and ideas discussed in this section are made for improving the evaluation procedure of the quality attribute 'track record'.

3.6.1 Review of CPP

CPP defines the quality attribute 'track record' as *" the tenderers record of completing projects to the quality standards required, on schedule and within budget "*. This attribute normally relates to the firm in question rather than the individual personnel involved. The CPP manual comments that in the case of newly formed firms or consortia, consideration may be given to the track record of named personnel who are offered for the project. The CPP manual also states that this attribute relates to the level of client satisfaction with the tenderers performance on relevant projects. Regarding this, the manual notes that tendering authorities should have a procedure for evaluating the performance of consultants at the conclusion of contracts. The performance report should be sent to the consultant for comment before being included in the tendering authority's records. It goes on to say that this performance record would provide a systematic basis for assessment of track record for future contracts, and such record assessment could be shared with other tendering authorities.

Though the above comments and notes, regarding performance monitoring, appear in the CPP manual there is very few tendering authorities formally evaluating the performance of the consultancy service they receive. One of the reasons for this is that currently TNZ has no formal written procedures for performance monitoring and evaluation. The fundamental review of CPP (Hughes, 1995) notes, that currently tender evaluation teams rely on the memory and subjective recollection of project managers who have worked with all or some members of the team proposed. A paper written after the above fundamental review states that performance feedback is an area identified by TNZ as requiring improvement and has been targeted as a result of the research carried out and experience gained (van Geldermalsen & McGeorge 1995).

The lack of performance evaluation means little information is being fedback for future use in the evaluation of track record. Evaluation teams evaluate the consultancy's track record on information presented in the tenderers proposal, their own experience with the consultancy and any follow-up on references they choose to render. The quality of the evaluation depends on the validity of the information received and rendered by the evaluation team. If the performance from past contracts is effectively monitored and feedback to the tendering authorities an accurate evaluation of the consultancy's 'track record' can be achieved. In chapter 4 the author of this report performs a detailed review and recommends a performance monitoring and evaluation procedure for CPP.

3.6.2 Literature Review

The ASCE (1988) suggest in their procedures for selection of design professionals that after receipt of proposals and the interviews a check with recent clients should be carried out, to determine the quality of performance. ASCE (1988) note that this check should not be limited to references given by the design professional.

Bryant's (1982) evaluation procedure pays little attention to the 'track record' of the consultancies considered for professional services. In the criteria for rating a consultant's basic qualifications there is one question regarding the track record of a consultancy; the

question asks the evaluation team to rate the professional and ethical reputation of the consultancy. There is no discussion in Bryant's (1988) evaluation procedure regarding the attaining of past performance, so one assumes that the evaluation team determines the past performance of the tenderer by the information received in the questionnaire and from contact with previous clients.

The amount information gained from such procedures described by ASCE (1988) and Bryant (1982) would provide limited content for evaluating a tenderers 'track record'. To score on the basis of this information would be subjective and unsubstantial, possibly resulting in a poor decision on which tenderer to award the contract to.

Kasma's (1987) selection considerations include the evaluation of 'past performance/ reputation'. Kasma suggests that references are checked to determine the quality of performance, noting that contact should not be limited to individuals listed as references. Other suggestions include carrying out on-site inspections of projects which the consultant has worked on, and/or contacting personnel operating a project which was designed or supervised by the consultant. To assist in future evaluation, Kasma (1987) includes in the procedure for the procurement of professional engineering services, the evaluation of the consultants performance after completion of the project. Kasma (1987) states the company or agency shall require an evaluation to be made relating to the performance of every engineering firm retained for a contract addressed by this policy. This information is to be maintained on file for reference purposes in future project awards.

The British Columbia Ministry of Transportation and Highway recommends in its selection procedure additional research on the favoured tenderer at the end of the evaluation process, which includes the checking of references listed in the proposal to confirm the previous performance, proficiency and reliability of the consultant. The Ministry also uses the R.I.S.P system, a computerised system that assists in the fair and equitable selection of consultants for Ministry engineering and technical contracts worth less than $1 million dollars. This system, which is described in detail in chapter 4 of this report, includes a performance evaluation procedure that entails the performance feedback of a consultant being input into the computer system and used in the pre-qualification stage of future selections.

3.6.3 Recommended Improvements to CPP

To improve the evaluation procedure of the quality attribute 'track record' under CPP it is recommended that more relevant information be attained. To gain more information it is recommended that a formal performance evaluation procedure be developed and implemented into the CPP*. Monitoring and scoring the performance of a consultant during their engagement and at the completion of a project can provide valuable information for future tenders. This is an important part of quality management, for without monitoring, evaluating and feeding back consultant performance quality improvement can not be achieved. Other information recommended is the verification and feedback from references, both those provided in the proposal and others the authority are aware of.

3.6.4 Summary

Currently under CPP the quality attribute 'track record' is evaluated on information presented in the tenderers proposal, the personal experience of the evaluation team with the consultancy and any follow-up on references they choose to do. It is recommended that formal procedures for evaluating the performance of consultants at the conclusion of contracts be developed and implemented into CPP. Information gained from the performance evaluation should be recorded and used in the evaluation of 'track record' for future contracts.

Time must be taken by the tendering authority to fully investigate the track record of a tenderer, particularly for consultancies the authority is not familiar with. This should include verification from past clients and project contractors. It is important when evaluating the quality attribute 'track record' that the content of the information is accurate and comprehensive enough for the evaluation team to accurately score. If the degree of variance between the scores is going to increase then the evaluation team needs the right information to differentiate the proposals from one another.

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* Chapter 4 of this report is a detailed review of performance evaluation procedures, the chapter develops and recommends a procedure suitable for the CPP.

3.7 COMPETITIVE BIDDING

The use of competitive bidding for the selection of professional services is a debate that has been going on in New Zealand since the introduction by TNZ of the CPP for professional services. This section will discuss the issues of competitive bidding and quality-price trade-off presented in two reviews of CPP, commissioned by TNZ. Also presented in this section is the findings of a literature review on the issue of competitive bidding. This section attempts to present the arguments of both sides of the debate, however it is limited to availability of support literature and reviews.

3.7.1 Review of CPP

In 1992 a review of the CPP was undertaken by Butcher and Coker, titled 'The Engagement of Professional Services'. It included a questionnaire for the TNZ Regional Offices, for local authorities who have made use of CPP, and for all consultants who had tendered for TNZ state highway work over the financial year 1991-1992. One of the questions asked was *"Do you consider that the CPP as required by Transit New Zealand affects the quality of the professional service and advice provided by consultants?"* The responses to this question are summarised in Table 3.2.

Table 3.2: Survey Results (Butcher and Coker, 1995)

Source	No change	Adverse	Favourable
TNZ Regional Offices	-	5	1
Local Authorities	8	2	1
Consultants	4	34	-

Butcher & Coker (1995) note that the concern of most consultants, the Association of Consultanting Engineers in New Zealand (ACENZ) and of a TNZ Regional Office, was of the quality of the engineering and supervision put in at the beginning of a project, as that quality determines the lifetime cost-effectiveness. If inputs into a project were being

dictated by the low tender price, the quality of the outputs in terms of what finishes up on the road would suffer, and could mean increased and continuing maintenance costs. Butcher & Coker (1995) note that forced competition does not provide quality service, because in the case of local authorities work was awarded to the consultant who could reduce the input and therefore reduce costs to the minimum that had been stated on the brief in the Request for Tender (RFT). This reduction in cost can be achieved by cutting corners when accepting design considerations such as by minimising site inspections or design effort by taking the conservative approach. As a result, the long-term total costs are generally greater. This is supported by Bell (1995) who notes that in several arbitration cases, where he has appeared as an expert opinion, the consultant, who has won the contract under competitive bidding, reduced costs by minimising site inspections. This has resulted in increased construction costs, variations and in some cases failures. The author has also heard of several instances where the cost of the service was reduced by limiting site visits and travel. In one case only the survey team visited the site and the design engineer relied solely on the surveyors topography for doing a geometric design.

In a later review of CPP by Hughes (1995), it was found that some public sector organisations have found that adding an element of price competition to the selection of professional services is necessary if there is a need to demonstrate equity, or fairness and freedom from influence, and 'value for money' in the expenditure of public funds. Hughes (1995) also reviewed the increase use of the Brooks Law method in CPP. This method would ensure that selection of the consultant is predominantly based on the non-price attributes. Hughes concludes that it would not be appropriate in the New Zealand context to tender all, or a majority of, TNZ funded work under Brooks Law method, stating that TNZ would lose its knowledge of market rates, and its ability to trade off less quality for reduced cost, when the risks of failure are low. He also recommends that it should be used only when the risks and costs of failure are very high. To support his argument is the fact that under the TNZ Act of 1989, TNZ is obliged to have regard for the efficient applications of TNZ funds, in a non-competitive bidding procedure TNZ can not demonstrate that it is meeting this obligation.

3.7.2 Literature Review

The ASCE (1988) states that Federal and most state legislative bodies, as well as professional engineering and architectural societies, recognise qualifications-based procurement of professional engineering and architectural services as the most productive and preferred method when compared to bidding. Bryant (1982) supports this statement by quoting the FIDIC guide to the use of independent consultants, which states

> 'The selection of a consulting engineer should never be based on competitive price bidding. Generally the amount of the fee paid to a consulting engineer is a minor consideration when compared to the total cost of a project. Any variation in fees charged by qualified consultants is still smaller consideration. Therefore, differences in fees between consultants should not be given major consideration in the selection of the engineer. The degree of satisfactory completion of the project and the total cost will be greatly affected by the amount of effort put into the project. In order to obtain optimum results it is essential that the relationship between the client and the engineer be based on mutual confidence."

Moore (1987) notes that in recent years a substantial trend toward soliciting comparative or competitive prices for an engineering service contract has developed. Moore (1987) argues that in the bidding situation, it becomes necessary for the engineer to change his [sic.] thinking and his actions from that of a trusted and knowledgeable professional adviser to that of a competitive merchant of technical services. The prospective buyer has, in effect, issued a challenge to the engineer to devise the ways by which he can use his [sic.] superior technical knowledge to beat his competition and the prospective buyer by naming a minimum price which will give the buyer exactly (and only exactly) what he has specified.

Kasma (1987) notes that when price is a factor in selecting consultants for negotiations, it usually becomes the deciding factor, particularly in public organisations. This is supported by the data collected on the scores for the CPP quality attributes shown in Table 3.1 of this chapter (Hughes, 1995) and discussed in the previous sections. Kasma

argues that the value of professional services cannot be measured monetarily, so no useful purpose is served by obtaining an engineer through competitive bidding.

The debate on competitive bidding includes the issue of cheapness which is discussed in most of the literature previously cited, as well as many others. Hallsworth (1993) notes that it has been suggested that a client is best served by the cheapest offer and it has become fashionable for competition for the design of buildings and structures to be judged solely on the lowest price. He argues that in this context cheapness is seldom synonymous with value for money. Cost may be cheaper in the early stages but usually leads to higher cost of construction, extra costs in operation and greater costs in maintenance. Bryant (1982) supports this by noting that price competition for professional services often results in the lowest price being offered by the firm which will provide the least service and which has the poorest qualifications. He goes on to argue that cheap advice is likely to be casual at best and often incompetent; consequently, it is usually more expensive in the end. Kasma (1987) also notes that with emphasis on price, the lowest fee proposal the client receives tends to result from a minimal interpretation of scope and quality and a low estimate of salaries and expenses required to perform services. Moore's (1987) argument is that in the price-competitive situation the technically competent and commercially astute engineer can usually win, and the customer is the loser. This is a probable result because the work product can never be specified with sufficient precision to assure that the buyer will really receive the quality and extent of service desired.

3.7.3 Summary

In 1992 a large portion of consultants and TNZ Regional Offices interviewed believed that CPP was having an adverse affect on the quality of the professional service and advice provided by consultants. It is their belief that under CPP consultants have to reduce input in order to reduce cost and therefore be competitive. The result being higher lifetime costs. Evidence supporting this argument shows that reduced input is being achieved by such tactics as minimising site inspections or design effort.

The fundamental review by Hughes (195) supports CPP by stating that if consultant selection is based predominantly on non-price TNZ would lose its market knowledge and trade-off ability, as well as failing to met its obligations under the ACT.

The majority of overseas literature reviewed in this chapter believe that competitive bidding is unsuitable for the procurement of professional engineering services. Arguments include that the amount of input by the engineer will reduce and that the cheapest offer is normally due to poor interpretation of the requirements, poor service and poor qualifications.

In the Transit New Zealand CPP for professional services the evaluation team is also required to evaluate the quality assurance system of the tenderers organisation. Quality assurance is all those planned and systematic actions necessary to provide adequate confidence that a service will satisfy given requirements for quality (ISO 8402:1986). Transit New Zealand CPP should ensure that the tendering authority understand the meaning of quality assurance, as well as the other quality concepts.

CHAPTER 4

PERFORMANCE EVALUATION

4.1 INTRODUCTION

Quality improvement encompasses both improving fitness for use and reducing the level of defects or errors, (Gryna, 1988). Quality improvement is one of the three management processes identified by Juran (1988) as forming the quality function. Though it is considered to be very important most organisations have traditionally conducted their affairs with limited priority on improvement (Gryna, 1988). Transit New Zealand is no exception to this observation. In terms of the TNZ CPP there is no specific procedures for enabling quality improvement of the service they provide to the public and receive from contractors.

The process of monitoring, evaluation and feedback of consultant performance should be an important part of quality improvement for CPP. Currently CPP has no formal procedure to measure the performance of consultants engaged to provide professional services. However, most involved with CPP agree that such procedures would be beneficial in the long term. Hughes (1995) notes, from their research, that there was a feeling among the consultant interviewed that Transit New Zealand does little to monitor or reward particularly good performance, or to penalise poor performance. The consultants in general said they would like more feedback from Transit New Zealand as their client, and would welcome improved communications in this area.

Hughes (1995) notes that there are three potential benefits for tendering authorities from implementing a consultant performance evaluation:

1) It would provide a documented performance record, which can be fed back into evaluations of track record, and if appropriate, other non-price attributes.

2) Regular performance monitoring discourages opportunistic behaviour. Monitoring is the only way in which the client can ensure that the outputs contracted for are, in the event, obtained.

3) Regular performance monitoring is the only way in which tendering authorities could challenge the assertion that the current system of tendering is threatening public safety by minimising the engineering input on roading projects.

Hughes (1995) goes on to state that the most important benefit of implementing a regular performance monitoring and review procedure will be to improve communication and feedback between the client and the consultant, and to increase the level of confidence and trust that services contracted for are being delivered.

Transit New Zealand also agrees that there is a need for a performance evaluation procedure. McGeorge and van Geldermalsen (1995) state that that performance feedback at the request of consultants will be introduced into CPP sometime in the future. At the time of the writing of this report, no formal procedure had been implemented into CPP.

The purpose of this chapter is to recommend a performance evaluation procedure suitable for CPP, including a record for future evaluation of the non-price attributes. The procedure focuses on project work, but may be applied to network maintenance contracts. To develop this procedure, the author approached Transit New Zealand, Local Authorities (LA), and consultancies for information on any procedures used for the evaluation of consultants engaged for professional services. In addition to this research on the New Zealand situation, the author performed a literature review and obtained information on the performance evaluation system used by the British Columbia Ministry of Transportation and Highways. This chapter discusses the findings from the research and presents the recommended procedure.

4.2 A REVIEW OF TNZ, LA AND CONSULTANT PROCEDURES

This section reviews the performance evaluation procedures use by Transit New Zealand and Local Authorities, as well as reviewing feedback received or requested by the

consultants. Letters requesting information on performance evaluation procedures were distributed to nine Local Authorities (LA) and eight consultancies. A copy of the letters sent to these organisations and a list of the organisations receiving letters are in Appendix B of this report. Of the nine LA letters distributed, seven replied; of the eight consultant letters, five replied.

In additional to this the researcher spoke to the head office of TNZ and two Regional Offices for comments regarding performance evaluation; they confirmed that currently there are no formal performance evaluation procedures being used by Transit New Zealand offices. All agreed that performance feedback was important for both improving communications with the consultant and evaluating future proposals. Comments regarding future procedures included ensuring the procedures are simple and that they are not time-consuming to complete. Suggested also was that the performance information should be in a form suitable for data entry into records, for use in future evaluations of the consultancy track record and, where appropriate other non-price attributes, such as methodology which is difficult to assess at the proposal stage.

Of the seven Local Authorities that responded, five (Wellington City Council, Christchurch City Council, Rotorua District Council, Southland District Council and Dunedin City Council) presented a form of performance evaluation procedures for professional services. Christchurch City Council performance evaluation of consultants engaged for professional serves consists of a questionnaire to be completed by the engineer supervising the contract. The questionnaire is appended to this report in Appendix C. Questions consisted of queries into the survey, test bores (where applicable), service location, plans, specifications, schedules, background information and changes (what and why). Each of the questions are answered by ticking yes or no and providing comments regarding the answer given.

Chrischurch City Council's procedure is focused on the design tasks and plan quality of the consultants work, because it is these areas that can affect the contractor's efficiency. By evaluating the design tasks and plan quality, the Council staff are able to determine whether the consultant is affecting the construction cost of the contract as well as the quality. Research has shown that the probability of contractor failure is higher on projects that have large number of design errors and omissions (Russell & Severson,

1992). Hence as Russell and Severson (1992) note high-quality design documents facilitate efficient construction through reduced costs, fewer changes, reduced number of disputes, better schedule performance, and higher quality in the final constructed facility.

Rotorua District Council have a formal performance evaluation procedure which consists of the " Contract Completion Report and Appraisal of Consultants Performance" form. These forms are completed by the Project Manager responsible for each professional services contract at the conclusion of the project. The information is collated in a database which also includes performance appraisals of physical works. This comprehensive form consists of sixteen questions predominantly answered by Poor/Satisfactory/Good/Excellent and an area allowing for comments. A copy of the form is shown in Appendix C of this report. The questions cover many areas regarding the performance of the consultancy including: timing, key personnel availability and performance, management, liaison with other Authorities, budget, quality assurance, supervision, conflicts, attitude, communication, defects in documents and overall performance.

Neither the Rotorua District Council nor Christchurch City Council procedures rate the questions with a numerical value. Though this is not necessary when feeding back information to the consultant, it useful when the information is to be stored in a database and used to help score the quality attributes of future proposals.

Southland District Council has no formalised performance evaluation criteria for consultants, however they do have general contract performance appraisals. The contract performance appraisal consists of completing a form for both the physical works and professional services contracts. A copy of the 'Contract Performance Appraisal' form is in Appendix C of this report. It consists of four pages; the first of the four pages requires reference information such as contract number and date. The second page requires comments on technical performance relevant to the project, which are prompted by a series of sub-headings including work knowledge, versatility, methodology, and quality control, as well as several others. The third page requires comments on the organisational performance relevant to the project; sub-headings include forward programming or planning, communication, progress achieved and organisation of work, as well as several others. Finally, the last page requires comments on factors which may

have impacted on the performance of the contractor beyond his or her control, and overview comments.

Wellington City Council has no formal performance evaluation procedures, though some departments have procedures for measuring and ensuring quality performance from the consultants they engage. For example, the Roading Commissioning Unit, whose responsibilities include the RAMM system, test the performance or ability of the consultants engaged for rating and roughness contracts. This is achieved by validation, which consists of a 'validation area' survey. The rating team is required to rate certain sections of road that are then rated by the Council. The contractor is supposed to have no more than two values per form that " exceed " the limits of variation. Though this example is not suited for a general procedure for the CPP, it is a good example of how performance can be evaluated in more detail and how each function or department of an organisation should be focused on ensuring quality is achieved.

Dunedin City Council (DCC) also has no formal performance evaluation procedure for professional services, however they have several processes that review performance of consultants. During a project, the Council staff have contact with the consultants regarding progress and require monthly progress reports from the consultant and meetings. On an annual basis, the roading staff of the Council meet informally to discuss consultant performance before the next tender evaluation round. In the DCC professional services contract documents, there is a clause regarding the performance criteria measured during a contract, which is shown in Appendix C. The performance measures listed in the clause include timeliness, variation, avoidable problems and budget management. This clause gives the client the opportunity to review the consultants performance though this does not necessarily occur. In the correspondence from the DCC roading manager, he also expressed several concerns about performance evaluation, including the need to measure a consultant's performance objectively. Also, regarding the use of the performance evaluation for selection of future consultants, this may not be a valid use of the evaluation when contracts for a particular discipline are infrequent. And wider, more subjective issues, which are difficult to measure, can effect the overall perceived performance of a consultant, distorting the evaluation. These are all valid points that must be considered when developing and using a performance evaluation procedure.

Of the five consultancies that replied, two had 'customer satisfaction' forms and at least two others had informal procedures for gaining feedback from clients regarding the performance of the consultants engaged in the particular contract. The first form received was from Manukau Consultants Ltd. This consultancy has a 'client review' form which asks for the clients assessment of the level of service regarding such issues as quality, timeliness and value of service, communication and professional relationship. The client assesses the service by ticking the appropriate box, and there is also an area at the bottom of the form allowing the client to comment on the service received. This form, shown in Appendix D of this report, is part of Manukau Consultants quality system, and is used for helping them to improve their quality of service, to meet and exceed their client's needs.

The second form received was from Works Consultancy Services; a copy of the form is attached to the report in Appendix D. The form includes nine questions regarding the level of their performance which is rated on a scale of 1 (poor) to 9 (excellent) and one other question which asks the client whether they would use the consultancy again. The performance questions cover such issues as compliance, satisfaction, timeliness, budget and progress reports; there is also an area allowing for the client to make any comments.

Beca Carter has no formal procedures, but they do have informal practice for gaining feed-back from the client. A senior officer will make contact directly with the clients periodically as the work proceeds to ensure there is satisfactory performance and to obtain the necessary feedback. Feedback may be in writing but more often is received as a verbal comment, is conveyed to the individuals directly involved for immediate action. Connell Wagner also has a informal procedure which involves gaining feedback from the client if any concerns are brought to their attention. They are however in the process of developing a 'customer satisfaction' form as part of their quality assurance system.

To develop a performance evaluation procedure or form, consideration has to be given to what criteria should be evaluated. The above procedures represent the ideas of various groups of roading engineers whose opinions should be considered in the development of a formal procedure for CPP. The criteria presented in the above procedures can be summarised as the evaluation of time, cost, plan quality, key personnel availability and

performance, management skills, supervision, liaison with other Authorities, conflicts, communication and customer satisfaction. For the purpose of using this criteria for evaluating the non-price attributes of future proposals, the data should be in a form suitable for a computer database.

4.3 LITERATURE REVIEW

This section is a literature review on the performance evaluation procedures and forms used in overseas organisations. The purpose of this literature review is to gain additional knowledge and ideas to assist in the development of performance evaluation procedure for CPP for professional services.

The National Cooperative Highway Research Program (NCHRP, 1988) examines performance measures used by the different states of the USA. NCHRP (1988) states that the primary purpose of the consultant performance rating is to provide an important evaluation factor in the selection of consultants for other projects. From the research carried out by NCHRP (1988), the general categories considered for evaluating performance included accuracy, quality, completeness of work, cooperation, coordination, calibre of management and staff, and timeliness.

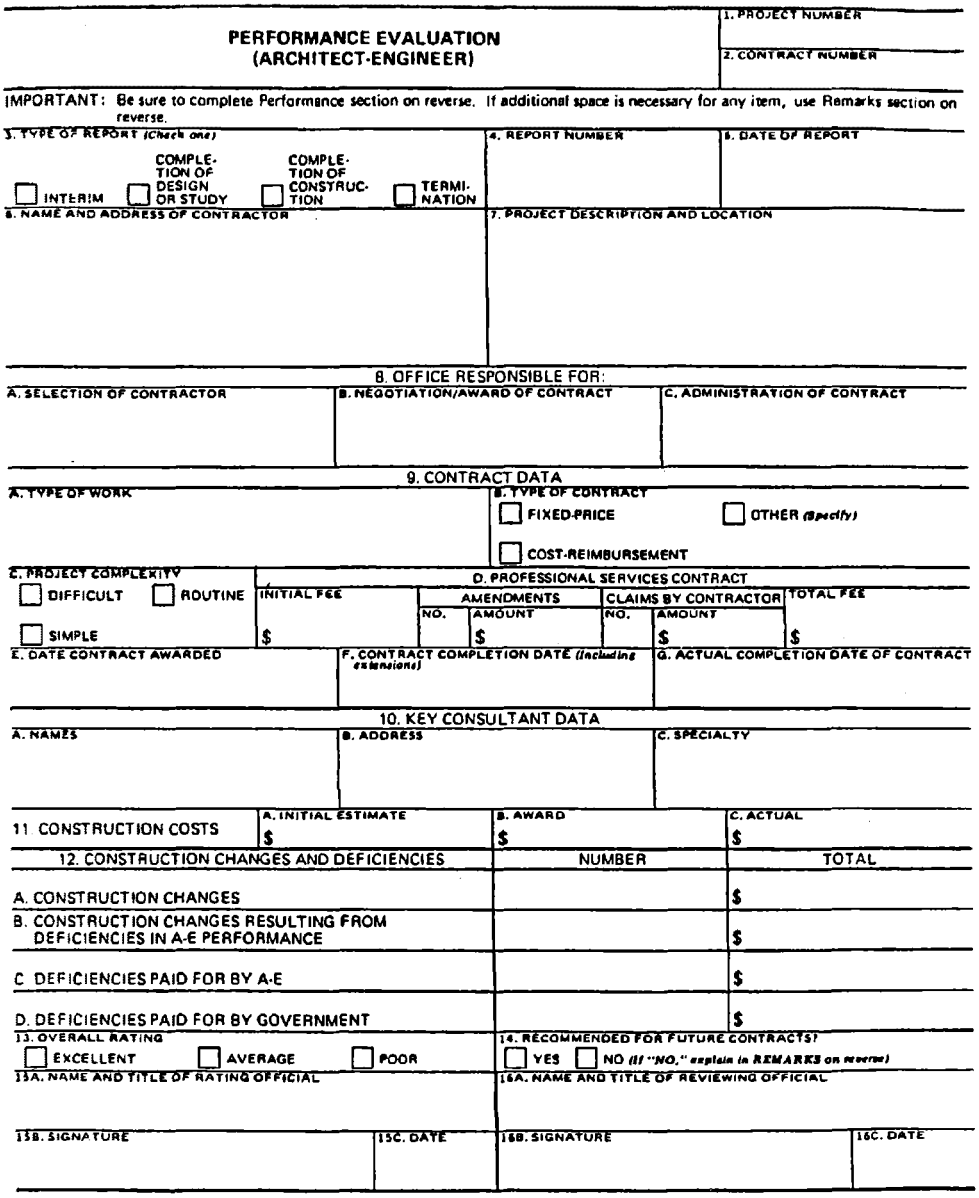
NCHRP (1988) also includes illustrative examples of the rating procedures and factors utilised by a sample of federal agencies in the USA. Included in the examples is the Standard Form 1421 for the evaluation of Architect-Engineer firms on direct federal contracts, shown in Figure 4.1. Section 12 of the form covers changes and deficiencies noted during construction. The categories for considering the overall performance of the consultant, is provided on the back of the form and is shown in Figure 4.2.

The state agencies reviewed by NCHRP (1988) included New Jersey, Pennsylvania, Indiana, Hawaii and New York. Both New Jersey and Indiana use a computerised system that can merge files containing general information about projects assigned to consultants with those containing the evaluation and capabilities of the consultants. New Jersey, in

addition to evaluating the general categories of the consultants performance, as mentioned above, also rated the design consultant during construction, taking into consideration the completeness of the plans, their accuracy in representing field conditions and the feasibility of the maintenance and traffic schemes. In addition to rating the performance of the firm according to the general categories, Pennsylvania required the identification of any of the consultants employees whose performance was outstanding and those whose performance was substandard. Pennsylvania (NCHRP, 1988) argue that because the capabilities of an engineering firm are greatly dependent on its key personnel, such employee information is valuable in selection. While in New York, additional information required includes the identification of the project manager and individual rating, and comments highlighting the consultant's specific strengths and weaknesses concerning various aspects of the work. This provides detail on the consultant's aptitude for different work categories.

Kasma (1987) discusses the process of performance evaluation in his paper on consultant selection. Kasma (1987) states that the client shall require an evaluation to be made relative to the performance of every engineering firm retained for a contract addressed by his policy. Provided in the paper is a list of factors for consultant performance rating (Appendix E); it includes the rating of 11 criteria by scoring each criteria between 1 (lowest possible score) to 10 (highest). The criteria covers timeliness, budget changes, continuity of key personnel, complaint handling, liaison with agents and end user satisfaction. This evaluation form is very simple but highlights several important factors to consider in the evaluation, including the criteria of key personnel continuity through out the project and end user satisfaction with the project.

The evaluation of plan quality at the construction stage is discussed by Russell and Severson (1992), who present results from an investigation that analyses and evaluates a plan quality evaluation form, developed by the Wisconsin Department of Transportation (WisDOT). Russell and Severson (1992) note that poor-quality plans and specifications can affect contractor efficiency, increase the likelihood of contractor failure, and increase the amount of resources required of the constructor, designer, and owner in preparing change orders, negotiations, mediation, and litigation. As cited previously in section 4.2, research has supported this observation showing that the probability of contractor failure is higher where there is large amounts of design errors and omissions.



PERFORMANCE EVALUATION
(ARCHITECT-ENGINEER)

1. PROJECT NUMBER
2. CONTRACT NUMBER

IMPORTANT: Be sure to complete Performance section on reverse. If additional space is necessary for any item, use Remarks section on reverse.

3. TYPE OF REPORT (Check one)
☐ INTERIM ☐ COMPLETION OF DESIGN OR STUDY ☐ COMPLETION OF CONSTRUCTION ☐ TERMINATION

4. REPORT NUMBER

5. DATE OF REPORT

6. NAME AND ADDRESS OF CONTRACTOR

7. PROJECT DESCRIPTION AND LOCATION

8. OFFICE RESPONSIBLE FOR:

A. SELECTION OF CONTRACTOR	B. NEGOTIATION/AWARD OF CONTRACT	C. ADMINISTRATION OF CONTRACT

9. CONTRACT DATA

A. TYPE OF WORK

B. TYPE OF CONTRACT
☐ FIXED-PRICE ☐ OTHER (Specify)
☐ COST-REIMBURSEMENT

C. PROJECT COMPLEXITY
☐ DIFFICULT ☐ ROUTINE ☐ SIMPLE

D. PROFESSIONAL SERVICES CONTRACT

INITIAL FEE	AMENDMENTS NO.	AMENDMENTS AMOUNT	CLAIMS BY CONTRACTOR NO.	CLAIMS BY CONTRACTOR AMOUNT	TOTAL FEE
$		$		$	$

E. DATE CONTRACT AWARDED	F. CONTRACT COMPLETION DATE (including extensions)	G. ACTUAL COMPLETION DATE OF CONTRACT

10. KEY CONSULTANT DATA

A. NAMES	B. ADDRESS	C. SPECIALTY

11 CONSTRUCTION COSTS	A. INITIAL ESTIMATE	B. AWARD	C. ACTUAL
	$	$	$

12. CONSTRUCTION CHANGES AND DEFICIENCIES	NUMBER	TOTAL
A. CONSTRUCTION CHANGES		$
B. CONSTRUCTION CHANGES RESULTING FROM DEFICIENCIES IN A-E PERFORMANCE		$
C. DEFICIENCIES PAID FOR BY A-E		$
D. DEFICIENCIES PAID FOR BY GOVERNMENT		$

13. OVERALL RATING
☐ EXCELLENT ☐ AVERAGE ☐ POOR

14. RECOMMENDED FOR FUTURE CONTRACTS?
☐ YES ☐ NO (If "NO," explain in REMARKS on reverse)

15A. NAME AND TITLE OF RATING OFFICIAL

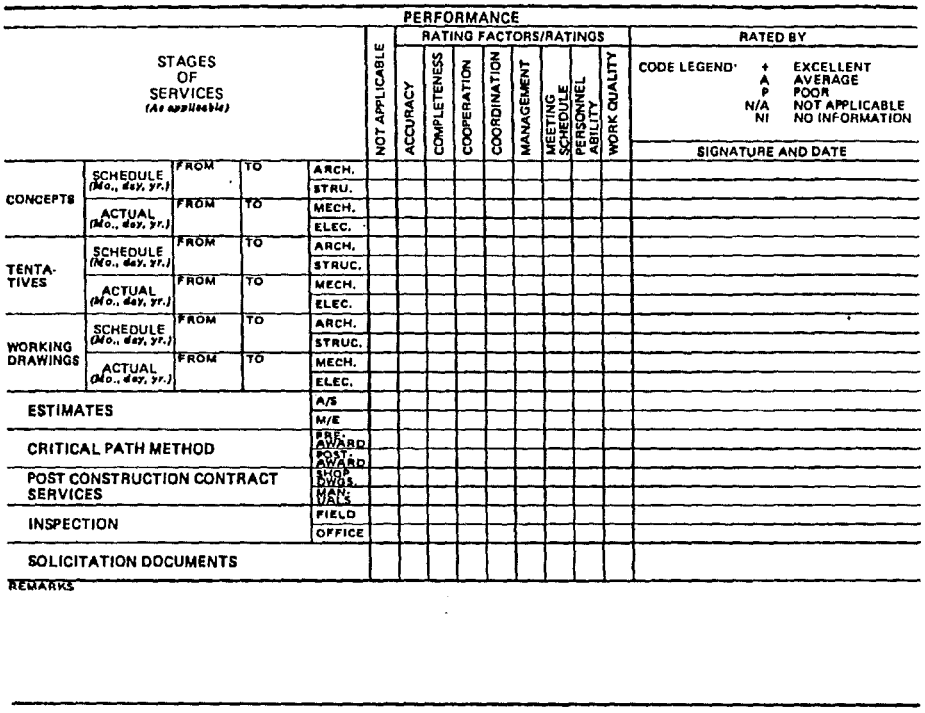
16A. NAME AND TITLE OF REVIEWING OFFICIAL

15B. SIGNATURE	15C. DATE	16B. SIGNATURE	16C. DATE

Figure 4.1: Standard Form 1421 (obverse), NCHRP, 1988

Russell and Severson (1992) study included interviews with prime contractors of 40 selected projects. The interviews identified several areas where the prime contractor had difficulties with past project designs. Five of these areas were consideration of equipment capabilities and limitations, lack of adequate field and soils investigation, inaccurate quantity estimates, utility coordination difficulties, and soil quantities for staged projects not listed by stages. In the interviews, the prime contractors were asked how feedback

about a project should be communicated to the project designer. The majority believed that in-person meetings would be more effective in communicating their difficulties with the project design than written comments.



PERFORMANCE

STAGES OF SERVICES (As applicable)					NOT APPLICABLE	RATING FACTORS/RATINGS: ACCURACY	COMPLETENESS	COOPERATION	COORDINATION	MANAGEMENT	MEETING SCHEDULE	PERSONNEL ABILITY	WORK QUALITY	RATED BY
														CODE LEGEND: + EXCELLENT; A AVERAGE; P POOR; N/A NOT APPLICABLE; NI NO INFORMATION
														SIGNATURE AND DATE
CONCEPTS	SCHEDULE (Mo., day, yr.)	FROM	TO	ARCH.										
				STRU.										
	ACTUAL (Mo., day, yr.)	FROM	TO	MECH.										
				ELEC.										
TENTATIVES	SCHEDULE (Mo., day, yr.)	FROM	TO	ARCH.										
				STRUC.										
	ACTUAL (Mo., day, yr.)	FROM	TO	MECH.										
				ELEC.										
WORKING DRAWINGS	SCHEDULE (Mo., day, yr.)	FROM	TO	ARCH.										
				STRUC.										
	ACTUAL (Mo., day, yr.)	FROM	TO	MECH.										
				ELEC.										
ESTIMATES				A/S										
				M/E										
CRITICAL PATH METHOD				PRE-AWARD										
				POST-AWARD										
POST CONSTRUCTION CONTRACT SERVICES				SHOP DWGS.										
				MAT'L VALS.										
INSPECTION				FIELD										
				OFFICE										
SOLICITATION DOCUMENTS														

REMARKS

Figure 4.2: Standard Form 1421 (reverse)

The designers of the forty selected projects were also interviewed. Russell and Severson (1992) note that designers interviewed agreed that constructive feedback about completed projects from highway construction contractors would be helpful. Examples of the type of information designers were interested in receiving included: equipment capabilities and limitations, accuracy of estimate of quantities, adequacy of traffic control plans, adequacy of soils investigation, cost-effectiveness of the design, completeness of plans, clearness of plans, and ease of understanding plans. There is some cross over between the difficulties experienced by the prime contractors and the type of feedback desired by the designer of the project, important considerations for future evaluation forms. Several ways for communicating feedback were suggested by the designers interviewed; one involved having the prime contractor use an unmarked set of plans during the construction. When problems and difficulties arise during construction the

contractor marks it on the plans. After construction, a follow-up meeting is held between the prime contractors, designer and the client representatives to discuss the difficulties encountered. Other suggestions included similar meetings at project milestones, having the designer visit the project during construction or having the designer involved with the final inspection of the project.

On the basis of their research and findings, Russell and Severson (1992) recommended a evaluation form for consideration by WisDOT. Appendix E of this report shows a sample of the evaluation form. The form consists of three parts: the first part is a checklist that requires rating of straightforward items of the plan, such as plan errors, accuracy, and quality. The second section consisted of short-answer questions that can provide the designers with beneficial information to consider in future design projects. The final section is for written comments related to difficulties encountered that require further elaboration.

Shenson (1990) notes that the final report of a project should be the essential part of the clients evaluation of the consultant's work. Shenson (1990) suggests that the client keeps in mind a few simple questions when evaluating the consultant and measuring their own satisfaction:

- Do the consultant's recommendations in the final report fulfil your needs - the reason the consultant was retained - and successfully solve your problems?
- Are the solutions realistic, practical, and affordable? Was the client organisation able or will it be able to implement the suggestions?
- Was the final report aimed to satisfy you, the client, and your needs, or was it an attempt to sell more or future consultanting services.

Though Shenson (1990) does not relate specifically to engineering consultants, his recommendations highlight basic customer service ideas that are often forgotten in professional engineering services, including basic questions such as: Would you use the consultant again? Would you recommend the consultant's service to anyone? Are you happy and satisfied with the service you received and the results of the consultation? Consultants should be interested in knowing the answer to these questions as they are important issues for improving future performance and marketing of their services.

The performance evaluation procedures presented above provide additional ideas for consideration in the development of the proposed performance evaluation procedure for CPP. NCHRP (1988), Kasma (1987) and Shenson (1990) discuss similar criteria for evaluating performance as that presented in section 4.2. While Russell and Severson (1992) provide more details on the evaluation of plan quality as well as arguments supporting the need to evaluate the quality of the designers work. The ideas presented by the prime contractors and designers interviewed by Russell and Severson (1992) provide several options for deciding what form of communication should be used to feedback performance evaluations to the consultant.

4.4 THE BRITISH COLUMBIA R.I.S.P SYSTEM

This section is a brief description of the British Columbia Ministry of Transportation and Highways Registration, Identification, Selection and Performance Evaluation (RISP) System. The RISP System is a computer system created to assist in the fair and equitable selection of consultants for Ministry engineering and technical contracts worth less than $1 million dollars (Interim Guide, 1995). The system stores and processes' information about engineering and technical consulting firms in a manner that ensures a fair process of candidate selection.

The interim guide on the RISP System (1995) describes the several steps involved in the its use:

- registration of engineering and technical companies on the system
- adjudication of firms as identification of those companies capable of doing specific work
- selection of potential proposal candidate's based upon prequalification.

Performance evaluation information is recorded for each firm as projects are completed for the Ministry. Each Performance Evaluation will form part of the respective company's activity file with the Ministry and will be used as a basis for evaluation of pre qualification limits. The performance evaluation process is schematicaly shown in Figure 4.3, and the Performance evaluation form is in Appendix E of this report.

The performance evaluation form of the RISP system addresses several important issues for determining the quality of a service. Time and cost are evaluated by specifying the scheduled completion date and the actual completion date, the estimated cost and the actual cost respectively. Room is allowed for comments regarding the scope changes in the contract. An evaluation of effective use of staff, time, communication, and methodology is achieved by responding yes or no to several short questions and rating the overall effectiveness of each criteria. The accuracy of output and the effectiveness of the financial administration is also evaluated. Finally, the overall performance rating is asked for and an area is left for comments form the evaluater and the consultant.

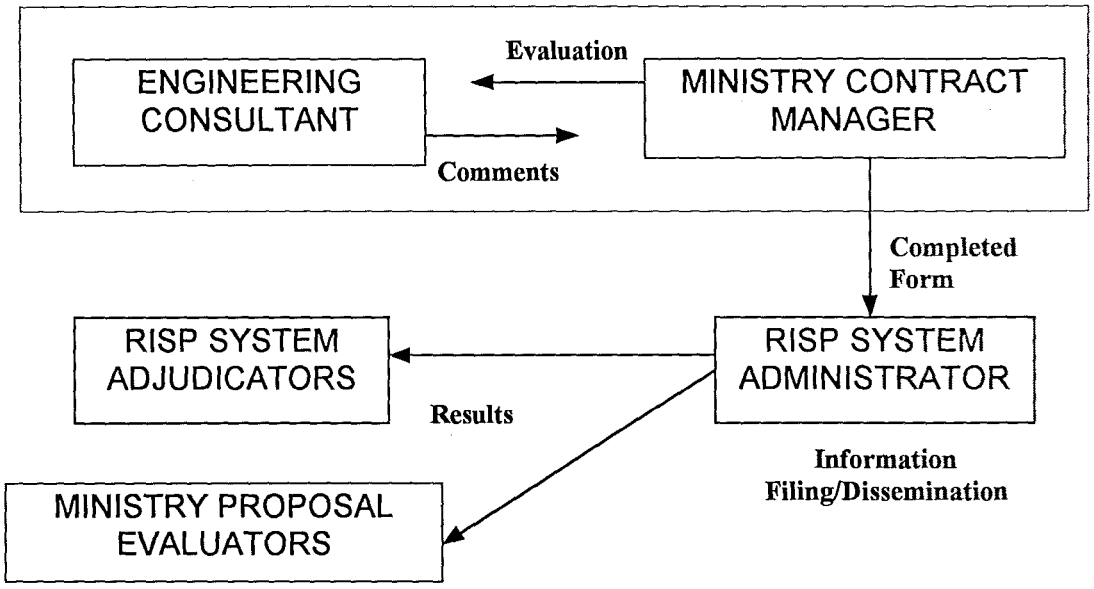


Figure 4.3: Schematic of the RISP Performance Evaluation Process (English, 1995)

The RISP System and the associated performance evaluation process, addresses many issues that can be applied to CPP. This includes the procedure of collating the data into the RISP System for processing in the preequalification stage of consultant selection. Though TNZ does not currently have a computer system it has been recommended that they set up a database for storing information on the performance of a consultant and processing for future selection. Another issue to consider for CPP is the criteria that is evaluated in the RISP System's performance evaluation form, this criteria addresses

several of the issues previously discussed in this report on the characteristics for providing a quality service.

4.5 PERFORMANCE EVALUATION PROCEDURE

The purpose of this chapter is to develop and recommend a performance evaluation procedure for the TNZ CPP for professional services. Based on the information presented in the previous sections of this chapter, this section develops and presents the proposed performance evaluation procedure for the CPP. Included in this section is a discussion of the considerations used to develop the procedure, followed by a description of the proposed performance evaluation procedure, including the proposed evaluation form and finally, recommendations for future work to fully implement a procedure into CPP.

4.5.1 Development of Procedures

This section will begin by identifying the organisations directly involved in a general roading project and their needs which must be considered in a performance evaluation procedure. The major organisations that are involved in roading projects are: the Consultant, the Client (including representatives) and the Primary Contractor. The needs of each of the organisation are summarised in table 4.1. By analysing the needs of the consultant, client and contractor the performance evaluation procedure can begin to develop.

First beginning with an analyses of the consultant's needs, which includes the need for feedback to assist in quality improvement. As discussed in section 4.1, quality improvement is an important process in the management of quality. The performance feedback from the client and contractor enables the consultant to identify the weaknesses and strengths of the personnel and the company's quality management systems. The performance feedback should be communicated to the consultant in writing and through

meetings with the client and contractor. This is supported by Russell and Severson (1992), who note that nearly all of the designers they interviewed stated that specific written comments, both positive and negative, from the contractors would be more helpful than a numerical rating number that indicated the quality of the plans. Most designers also stated that a meeting between the designer, prime contractor, FHWA and WisDOT representatives could also be helpful in communicating difficulties encountered during the project.

Once the feedback has been received, the consultant must be able to respond to the performance feedback, and their respondence recorded for future references. The legal and ethical obligations of this requirement have not been investigated in this report, so before implementing this procedure an inquiry into this matter should be carried out.

Table 4.1: Needs considered in the development of a performance evaluation procedure.

	Needs
Consultant	Feedback for quality improvement Opportunity to respond to evaluation prior to being filed Verbal and written feedback Improved communication
Client	Information in suitable form for database Use evaluation information for future selection Simple, quick and effective evaluation procedures Feedback for improving CPP selection procedures Improved communication
Contractor	Improved communications with designer and client Reduction in poor-quality costs Time restrictions for filling in forms and attending meetings

Communication is an important part of quality. Oakland (1994) states communication as one of the basic building blocks of TQM. Improvement in communication is a major benefit of a performance evaluation procedure and the proposed procedure should

encourage as much communication between the organisations as practical. Improved communication has been identified as a need of all the organisations.

The client, which is the roading authorities in the case of the CPP, requires information to be in a form suitable for a database. A database on the performance of a consultant can be used to assist the evaluation of future proposals. Because of the difficulties in evaluating some of the quality attributes at a proposal stage, information on how the consultant performed on past projects can be used for predicting how they will perform in the future. A numerical rating is most suited for databases because a number is less time consuming to record, input and process. Though a numerical rating conflicts with the needs of the consultant, a combination of written comment and numerical rating can be incorporated into a performance evaluation form.

By providing information on the past performance of a consultant, the CPP selection procedure will improve. The more accurate and relevant the evaluation information is, the greater the chance of selecting the consultancy who can provide a quality service. In addition, feedback on the performance of the consultant will help determine if the CPP selection process is working. If a consultant performance on projects is continuously poor, then the selection process is failing to identify a consultant who can provide a quality result.

For all three organisations it is important that the time to evaluate the performance of the consultant and to attend associated meetings be kept to a minimum. If the time spent on the performance evaluation is controlled and effective then quality improvement will be benefit all companies, but if the procedure is time consuming and ineffective, the motivation to evaluate performance and the benefits will diminish.

As cited previously, the ability to improve the quality of plans received from the designer will reduce construction cost. Therefore, it is important that the contractor gets the opportunity to feedback information on the quality of plans to the designer. It is the contractor who is directly affected by the quality of the plans, and is in the best position to accurately evaluate plan quality.

4.5.2 The Procedure

The major part of the proposed performance evaluation procedure is the performance evaluation form that is to be completed by the client and contractor at the completion of the project. From the analysis of the Local Authorities', consultancies' and overseas' evaluation forms and the identified needs of the client, consultant and contractor, a performance evaluation form was developed and is shown in figures 4.4.

The first section of the proposed evaluation form is the background information needed for future referencing. Section two is the rating of the non-price attributes methodology, technical skills, and management skills. The questions, requiring the response of yes or no, address issues that are difficult to evaluate at the proposal stage and are best evaluated at the end of a contract. After answering the questions about the methodology, technical skills and management skills, the client is then requested to rate the overall performance of the consultant regarding these three quality attributes. As previously cited key personnel can influence the success of the project and this is why attention is given to the performance of the Project Manager and the utilisation of the key personnel. The numerical ratings from this section are to be entered into a database for future project selection. A space for comments by the client about the performance appraisal of these three attributes is provided for referral in the meeting following the form completion and for the purpose of providing the consultant with more details on their performance evaluation.

Following the non-price attribute section is the overall performance evaluation section. Ratings from this section are for the scoring of the attribute 'track record' in future selection procedures under CPP. As cited in Chapter 3 of this report, the quality attribute 'track record' is the tenderers record of completing projects to the quality standards required, on schedule and within budget. The first two subsections address the ability of the consultant to complete the projects on time and within budget. This subsection allows the client to review the differences in the estimated cost and actual cost, and the proposed completion time and the actual completion time, which includes assessing the reasons for any delays or extra costs. Also obtained is an overall rating of timeliness and budget management for scoring purposes. The third subsection reviews

Figure 4.4: Proposed Performance Evaluation Form

PERFORMANCE EVALUATION FORM

PROJECT NAME:_____

PROJECT DESCRIPTION:_____

CONTRACT NUMBER:_____ COMPANY NAME:_____

EVALUATION BY: _____ Signature and date:_____

KEY FOR RATING: 1= UNACCEPTABLE, 2= POOR, 3= ADEQUATE, 4= GOOD, 5= EXCELLENT

NON-PRICE ATTRIBUTES

1. METHODOLOGY

Was the consultant's methodology innovative? Yes/No

Was the methodology effective ? Yes/No

RATING ☐

2. TECHNICAL SKILLS

Did the assigned key personnel perform effectively ? Yes/No

Were the personnel listed in the proposal, or approved substitutes used as intended? Yes/No

RATING ☐

3, MANAGEMENT SKILLS

Name of Project Manager (PM):_____

Was the P M committed to the project ? Yes/No

Was the P M effective ? Yes/No

How do you rate the overall performance of the PM ? ☐

COMMENTS

_____

_____

_____

_____

_____

OVERALL PERFORMANCE

1. TIME

SCHEDULED COMPLETION DATE:_____

ACTUAL COMPLETION DATE: _____

Please rate the overall timeliness of the service ☐

COMMENTS (reason for delay)

_____

_____

_____

2. COST

ESTIMATED ASSIGNMENT COST:_____

ACTUAL ASSIGNMENT COST:_____

Please rate the value of the service received ☐

COMMENTS (reasons for extra costs)

_____

_____

_____

3. OUTPUT

Did the results comply with the terms of references? Yes/No

Did the results respond to your needs? Yes/No

Please rate your level of satisfaction with the service received. ☐

4. STANDARD OF COMMUNICATION

Was the level of communication with the client appropriate? Yes/No

Was liaison with Authorities initiated and followed through? Yes/No

Was public liaison handled appropriately? Yes/No

Were progress reports submitted on time and complete? Yes/No

Please rate the overall standard of communication ☐

COMMENTS:_____

_____

_____

_____

5. QUALITY OF PLAN (REFER ATTACHED SHEET) AVERAGE RATING ☐

CONSULTANT COMMENTS:_____

_____

_____

NAME:_____ Signature and date:_____

the output received from the consultant, an important consideration because the quality of a service is dependent on the conformance to the requirements and customer satisfaction. Communication is evaluated in the fourth subsection as part of the evaluation of quality, a criteria for scoring the track record of a consultancy. The short questions requiring the response of yes or no, give a break down of the important aspects of communication that should be addressed by the consultant, and provide the consultant with specific areas for improvement in the future. An area is allocated for written comments, giving the client the chance to discuss their evaluation of the output and communication skills. The final part of the third section is the quality of the plan, which is evaluated on a separate form shown in Figure 4.5 and is to be completed by the contractor.

The plan quality evaluation form is a series of questions addressing the quality of the contract plans and documentation, including the site investigation details. Each question requires the contractor to respond with a score between 1 and 5 and provide written comment. The contractor is then required to return the form to the client, who totals the scores to calculate the average rating; this score is considered in the evaluation of the consultancy's track record. For future reference this form is attached to the performance evaluation form. As a guideline, it is recommended that the contractor keep a set of plans for marking on comments, difficulties and errors encountered during construction. Marked plans will be useful for evaluating the plan quality at the end of the project and providing recorded detail for discussion at the closing meetings.

Finally the performance evaluation form is sent to the consultant who reviews the evaluation of their performance and makes any comments on the bottom of the form. Once the forms are complete and returned to the client a meeting between the consultant, the client and the contractor should be arranged. At the meeting the performance evaluation is discussed and the consultant is able to gain more feedback about any issues that may of risen in the forms. Once all the issues are addressed and the organisations are in agreement the rating data is entered into a database and the forms, along with the minutes, from the meetings are filed by the client (TNZ) for future reference.

Figure 4.5: Proposed Plan Quality Evaluation

PLAN QUALITY EVALUATION FORM

PROJECT NAME:_____

PROJECT DESCRIPTION:_____

CONTRACT NUMBER:_____ CONTRACTOR'S NAME:_____

EVALUATION BY: _____ Signature and date:_____

CONTRACT PLANS AND DOCUMENTS

Please circle the appropriate answer

a) How complete were the plans?

5. Perfect 4. Very complete 3. Generally complete 2. Several omissions 1. Many omissions

COMMENTS:_____

b) Could you easily set out the project from the plans?

5. No problems 4. Few problems 3. Some problems 2. Several problems 1. Serious problems

COMMENTS:_____

c) Were the plans accurate?

5. No errors 4. Few errors 3. Some errors 2. Several errors 1. Serious errors

COMMENTS:_____

d) Was the site investigation information:

5. Excellent 4. Good 3. Adequate 2. Poor 1.Unacceptable

COMMENTS:_____

e) How satisfactorily were the services checked?

5. Excellent 4. Good 3. Adequate 2. Poor 1.Unacceptable

COMMENTS:_____

f) Where changes were necessary was the response of the designer:

5. Excellent 4. Good 3. Adequate 2. Poor 1. Unacceptable

COMMENTS:_____

g) How adequate were the specifications?

5. Excellent 4. Good 3. Adequate 2. Poor 1. Unacceptable

COMMENTS:_____

h) How accurate were the quantities?

5. No errors 4. Few errors 3. Some errors 2. Several errors 1. Serious errors

COMMENTS:_____

ADDITIONAL COMMENTS: _____

4.5.3 Future Requirements

There are several issues that must be resolved before the above performance evaluation procedure can be implemented into CPP. These issues include:

- how often the performance of a consultant should be evaluated,
- what type of projects should be evaluated,
- the development and implementation of the database for the recording and processing of performance evaluation ratings, and
- the legal and ethical considerations for performance evaluation of professional services.

Russell and Severson (1992) analysis and evaluation of a plan quality evaluation form provides several suggestions for consideration in the decision on how often and what type of project should be evaluated. Russell and Severson (1992) note that of the prime contractors interviewed, half would like to provide feedback for every project. If providing feedback for every project were not possible, several suggestions were offered: randomly sample all project types and sizes; evaluate only projects where major difficulties were encountered; have the prime contractor choose the project to comment about; base the selection of projects on type, size and complexity; or select projects with unique or unusual conditions. The majority of designers interviewed in by Russell and Severson (1992) would like to have feedback from every project. Since this may not be possible the designers suggested the following criteria: random sampling of all project types and sizes, major projects only, only projects that encountered major difficulties, projects that were unique or had unusual conditions, projects that had difficulties that might be of interest to designers, or projects selected by the project engineer.

To resolve these issues and implement the performance evaluation procedure a consultation process should be carried out. Meetings and discussions should be held with representatives of the three organisations (TNZ/LA, contractors, and consultancy). This may be a lengthy process but consideration must be given to the concerns of the organisations involved.

4.6 SUMMARY

To assist in the development and recommendation of a performance evaluation procedure for the TNZ CPP for professional services a review of the TNZ, LA, consultant and overseas procedures was performed.

Transit New Zealand employees interviewed by the author agree that a formal performance evaluation procedure should be developed and implemented into CPP. TNZ require the procedures to be quick and simple to complete, and in a form suitable for a database. TNZ would like the non-price attribute 'track record' and if appropriate the other quality attributes; to be considered in the procedures.

Performance evaluation procedures of five Local Authorities (LA) and the procedures used by four consultancies for gaining performance feedback from clients were reviewed. Three LA had formal procedures: one focused on evaluating the design tasks and plan quality, and another evaluated issues regarding time, budget, defects and communication. The third LA evaluated the contractors of physical works and professional services on their technical and organisational performance relevant to the project. Of the three LA with formal procedures, the Rotorua District Council was the only one to collate evaluations into a database for future selections. Two LA have no formal procedures, though one included in their contract documents a clause regarding the performance criteria that may be measured during a project. The other LA had procedures for measuring the capabilities and performance of consultancies engaged in specific roading assignments, such as RAMM surveys.

Of the consultancies who replied, two had 'client review' forms for gaining feedback from the client on their project team's performance. The performance information gained regarded time, budget and satisfaction. Two other consultancies had informal procedures for gaining feedback from the client. This consisted of verbal contact with the client on a regular basis or when problems arose.

A literature review on overseas performance evaluation procedures included the review of the NCHRP (1988) examination of performance measures used by the different states

of the USA. From their research, NCHRP observed that the general categories considered for evaluating performance included accuracy, quality, completeness of work, cooperation, coordination, calibre of management and staff, and timeliness. Additional categories evaluated by the different states included the rating of individual performances, and specific strengths and weakness of a consultancy. Two states that collated evaluation data on to a computerised system were cited by NCHRP.

Russell and Severson (1992) discuss the evaluation of plan quality at the construction stage, based on their analyses and evaluation of WisDOT plan quality evaluation form. Russell and Severson's study included interviews with prime contractors and designers of forty selected projects. From the interviews it was found that both groups of people believed feedback on the plan quality to the designer would be helpful particularly when communicated in writing and in-person meetings. There was a cross over of areas that the prime contractor has had difficulties with in the past and areas the designer would like feedback on. These areas consisted of equipment limitations and capabilities, adequacy of field and soils investigations, accuracy of quantities and completeness of plans.

Kasma (1987) presented a performance evaluation procedure which consisted of rating eleven criteria, the more important issues considered included timeliness, budget, continuity of key personnel, complaint handling, liaison with agents and end user satisfaction. Shenson (1990) provides several fundamental questions that should be answered by the client when evaluating the consultant's work. The questions were concerned with customer satisfaction and meeting the requirements; these issues need to be feedback to the consultant to assist in both quality improvement and marketing.

A detailed analyses and description of the British Columbia Ministry of Transportation and Highways RISP System was also performed to assist in the development of a performance evaluation procedure for CPP. The RISP System includes the completion of a performance evaluation form at the end of a project. Each performance evaluation is then entered into the respective consultancy's activity file with the Ministry and used as a basis for evaluation of prequalification limits. The criteria evaluated by the Ministry includes time, cost, and the effective use of staff, time, communication and methodology.

The proposed performance evaluation procedure for the TNZ CPP was developed based on the identified needs of the client (TNZ, LA), the consultant and the primary contractor, and the analysis of New Zealand and overseas procedures. The procedure consists of a performance evaluation form which evaluates the consultants non-price attributes: methodology, management skills , technical skills and track record, at the completion of a project. As part of the evaluation of the consultants track record, a plan quality evaluation form was developed and is to be completed by the prime contractor.

Before the proposed performance evaluation procedure can be fully implemented into the CPP, several issues must be further reviewed, including:

- how often the performance of a consultant should be evaluated,
- what type of projects should be evaluated,
- the development and implementation of the database for the recording and processing of performance evaluation ratings, and
- the legal and ethical considerations for performance evaluation of professional services.

CHAPTER 5

COMMUNICATION

5.1 INTRODUCTION

The importance of communication in human relationships is generally understood by the majority of individuals. Each day we engage in some form of communication whether it is intrapersonal, interpersonal, public or mass communication. Communication between people is complex because of our dynamic and unpredictable nature, consequently difficulties in the communication process can occur. There is a need to minimise these difficulties to ensure that messages are successfully communicated. In the past communication within the engineering profession has been rigid and formal. This is not always effective, as communication needs to be flexible, changing to suit the circumstances and the individual.

As previously cited communication is one of the building blocks of TQM. Ineffective communication can affect the quality of a service or product because of the major role communication plays in quality management systems. If for example the communication between staff and management, or the client and the consultant is poor, the performance of the individual can be affected including the quality of their work.

The purpose of this chapter is to review the communication process and begin to gain an understanding of how communication can be improved in professional engineering relationships. Recommendations are made for the CPP in an attempt to improve communication between the client and the consultant. This research into communication is a preliminary study, to begin an investigation into effective communication for professional engineering.

5.2 THE COMMUNICATION PROCESS

The traditional model, as shown in figure 5.1, can be used to explain the communication process. This model uses data transmission to explain communication, but as noted by Elkin (1995), this type of model does tend to under-emphasis the human factor. Although this model is incomplete, Elkin (1995) notes, that the model can draw attention to the elimination of various types of noise, encourage thoughts about channels of communication and also lead to some improvement in the mechanistic parts of communication. This model can be applied to the communication processes between the client and the consultant where both parties attempt to exchange information and form a relationship.

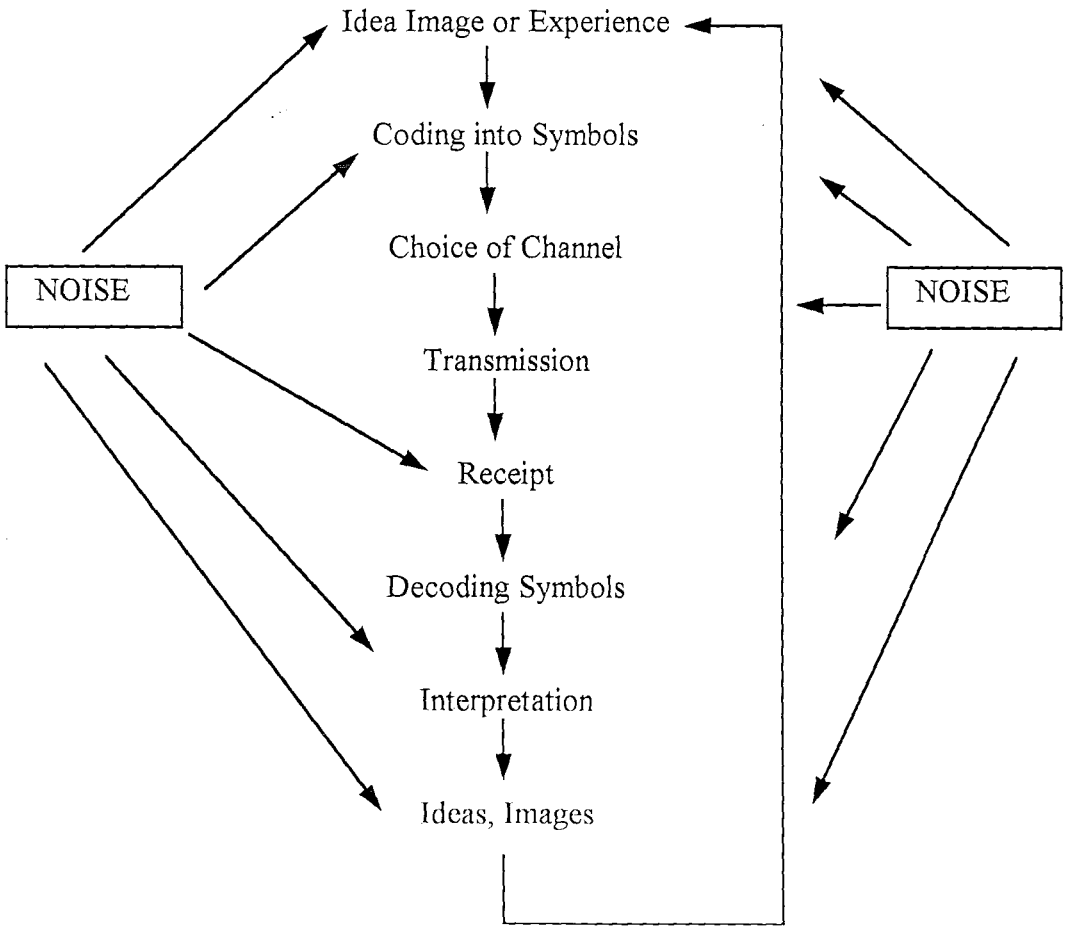


Figure 5.1: Traditional Model of Communication (Elkin, 1995)

An example of the communication process between the client and consultant can provide an explanation of the model. To begin the communication process, it is important that the client has a clear idea of what it is he or she wishes to communicate to the consultant. The client must not just have an idea of what information they want to transmit but also what reception they hope for and the action they want to result from the communication. The client needs to understand and use the appropriate symbols and codes for their ideas. In the case of roading projects, it is necessary for the roading authority to use their own engineering experience or an experienced staff engineer to communicate the message so the ideas are in the correct symbol and code to be received and translated by professional engineers. The evaluation of a message can depend on the credibility of the messenger. Poor credibility or reputation can be an example of noise which distorts the message. To effectively communicate the message the amount of noise should be kept to a minimum. The noise may arise from physiological, psychological, semantic, perceptual, physical and other such interferences. Once the message or idea is received and interpreted, feedback from the consultant must be sorted by the client, to determine the consultants understanding, reception and action so that further or corrective communication can occur.

Feedback is an important part of communication because without it the communication process is only one-way and one does not know whether the message has been received and interpreted as planned. Elkin (1995) notes that fundamental to our approach to communication is a recognition that communication is a two-way process, and transactional in nature. By having a two-way exchange of information, a interpersonal relationship can develop; how healthy the relationship is depends on the nature of the shared knowledge, the honesty, authenticity and the trust. Only over time and much two-way communication can the interpersonal relationship become healthy and strong. This is supported by Moore (1986) who states that only when effective communication and understanding has been accomplished, is it possible to create the relationship of mutual confidence and trust which is needed for a really beneficial client-consultant relationship.

Based on this discussion of the communication process it becomes apparent that to assist in the development of a beneficial client-consultant relationship, the CPP needs to encourage effective two-way communication. Encouragement can be done by allowing as much chance for communication during the tendering, selection and project stages as

possible. The following section discusses the ways in which this can be done in the TNZ CPP.

5.3 COMMUNICATION IN CPP

Throughout the previous chapters several areas have been highlighted where CPP could be improved to allow more communication. In this section these recommendations are further discussed, as well as the current communication opportunities in CPP.

Currently under CPP the project scope and specification is communicated to the tenderers in a written form and included in the RFT. When evaluating the proposals the evaluation team is permitted under the CPP to conduct face to face interviews for the purpose of clarifying the contents of the tender. However, this is not encouraged as TNZ believes clarification of tender content should, in most circumstances, be in writing. TNZ argues that if such interviews become too common it will encourage less precision in tender preparation, as well as being expensive. TNZ does acknowledge that interviews are useful when the tendering authority does not know the individual personnel well and the contract in question requires significant contact with the public.

Other face to face communication occurs in price negotiations. This is performed under the CPP Brooks Law evaluation method and where only one conforming tender is received. In most circumstances this is the first time that the tendering authority has face to face contact with a tender. This is not an ideal situation to begin building a relationship as negotiations are very formal and communication takes place with much caution. Communication also occurs once the winning tender is established; this is in the form of feedback to all tenders on the results. The CPP specify that all tenderers shall be provided with a summary of the tender evaluation and recommendation. The information that is recommended to be provided includes:

- name of the successful tenderer
- price of the successful tender
- number of tenders received
- price range for conforming tenders
- range of scores for each non-price attribute

- for each tenderer, their individual attribute scores
- reason for accepting other than the lowest priced conforming bid if this occurred.

Feedback is an important part of the communication process; feeding back the results to the tenderers will enable the consultancy to determine how the message in the proposal was received by the tendering authority. The consultancy is able to determine where its weaknesses are both in communicating the message and in the necessary qualifications for the project type.

The CPP appears to be lacking communication opportunities for two way, particularly face to face, communication. From the reviews of overseas selection procedures, in Chapter 3 of this report, it is apparent that there are several improvements that could be made to encourage more communication. As already mentioned in chapter 3, it is recommended that in large or complicated projects that the scope of the project be presented to the tenderers in both oral and written form. After the request of tenders have been received a 'explanatory meeting' should be held for all interested parties to attend. The scope of work should be discussed between the client and prospective tenderers. This type of oral presentation enables face to face communication to occur. The client and tenderers can be more confident that the requirements have been correctly understood. Having the opportunity to meet the tenderers at this early stage enables client-consultant relationships to start developing.

Interviewing at the evaluation stage is also recommended. This type of two way communication allows the evaluation team to get a clearer idea of the consultancy's attitude, commitment and compatibility. Moore (1986) discusses compatibility, suggesting that in addition to the general attributes used to evaluate a tender, the tenderer should be evaluated on compatibility. Moore (1986) notes that the client and the engineer need to reach a common understanding of the desired order of importance and priority. Also that there is the need for the basic philosophies and value systems of both the client organisation and the consulting organisation and their principal representatives to be reasonably similar and fully compatible. If this type of understanding is going to be achieved there must be effective communication between the client and tenderer.

The performance evaluation procedure recommended in chapter 4 of this report forms an important part of the communication process, that is feedback. Not only will it enable a formal procedure for ensuring feedback is given to the consultant it will improve and allow for more communication between the client, consultant and the contractor. As previously cited, communication is an important process for the management of quality. Encouraging the development of effective communication through CPP will improve the management of quality and therefore the quality of the service received will also improve.

5.4 SUMMARY AND FUTURE RESEARCH

The communication process can be explained as the transmission of a message with the consideration of the codes, symbols and channels for transmitting the message, the interpretation of the message, including the affect of noise, and feedback to the transmitter on how the message was received and actioned. Feedback plays an important part in measuring the success of the communication process.

To encourage effective communication between the client and the consultant it is recommended that the CPP include an "explanatory meeting" to assist in the communication of the scope of work. Also recommended is the encouragement of interviews during proposal evaluations, to assist in the development of a effective client-consultant relationship, and the introduction of feedback procedures in the form of the performance evaluation procedures presented in chapter 4 of this report.

This chapter has only briefly looked at communication in professional engineering. However, it is an important issue as most disputes arising between the client and consultant can be linked to ineffective communication. This is supported by Moore (1986) who notes that a large proportion of the disputes between clients and engineers is a result of different understandings about what can reasonably be expected as a result of the engineering services planned. Quality mutual understanding necessary for a constructive client-consultant relationship can only be reached by effective communication. The closed, one way communication which still exists between the client

and consultant is no longer considered effective. Cammock (1987), in discussing the successful industrial relations at Motonui construction project, notes that for both management and union respondents "close communication" was frequently cited as the reason for Motonui's low conflict levels. In this case communication was facilitated by regular formal meetings and informally by an "open door" policy.

The author believes that there is a need for future research into effective communication processes for professional engineering and a need for recommendations to be made on further improving the relationship between the client and consultant. It is important that the future communication processes help form relationships that are close, open and mutually beneficial to both parties.

CHAPTER 6

CONCLUSIONS

As stated in the introduction of this report, the quality of professional services received as a result of the CPP is going to play a major role in assessing whether TNZ is achieving its principal objective. In order to ensure and evaluate whether quality is being achieved under the current CPP for professional services, quality and the quality concepts must be defined and understood. There is no evidence that TNZ has taken the step to ensure that the evaluation teams of the tendering authorities have an understanding of quality. The CPP for professional services fails to define quality or provide an explanation of the quality concepts expected to be evaluated by the tendering authority.

Data collected during the fundamental review of CPP for professional services (Hughes, 1995) shows that over time a rise in average scores of the quality attributes and a narrowing of variation between the scores has occurred. However, the degree of variance of the price scores remains wide. If a quality-price trade-off was being made it would be expected that the greatest differentiation would occur for the quality attribute 'methodology', however 'relevant experience' had the widest variation for the quality attributes. The fundamental review (Hughes, 1995) and TNZ (van Geldermalsen and McGeorge, 1995) concluded from the data that the scoring and evaluation of the quality attributes required further research because the quality-price trade-off was not being made. The fundamental review identified several concerns and problems regarding the evaluation of the five quality attributes.

The process of monitoring, evaluating and feedback of consultant performance is an important part of quality improvements for both the consultancy and the roading authority. Currently the TNZ CPP for professional services has no formal procedure for evaluating the performance of a engaged consultant. Benefits that could be gained from such procedures include providing a documented performance record, which can be fedback into future evaluations of track record, and where appropriate, other non-price

attributes. Another benefit is the improved communication between the client, the consultant and the contractor.

Communication is identified as a building block of total quality management, yet the importance of communication is often ignored by organisations; poor communication can be a major contributor to system failures. Currently the communication processes in CPP is limited by the use of written communication which can restrict two-way communication between the client and consultant. Professional and beneficial relationships between the client and the consultant can only be created through effective communication; this should include as much face-to-face, two-way communication as possible. Negligible research appears to be done on the communication processes suitable for professional engineering services, particularly for developing effective client-consultant relationships.

6.1 RECOMMENDATIONS

The following recommendations are made for the purpose of improving the evaluation of the quality attributes of a consultant for the procurement of professional engineering services under the TNZ CPP:

1. Under the TNZ CPP for professional services, quality should be defined as 'meeting the requirements needed to achieve fitness for use'. This should include meeting the requirements of the owner, design professional, constructor, regulatory agencies, the end user, the environment, and the Tangata Whenua. As well as providing a definition for quality in the CPP, TNZ should ensure through training and the CPP manual that the evaluation teams of the roading authorities fully understand the concepts of quality including quality management, quality management systems and quality assurance.

2. The scope of work should be presented in both oral and written forms to improve communications between the client and tenderers, which will consist of introducing an 'explanatory meetings' in the CPP. Verbal and written communication will assist in

ensuring that the scope of work is clearly understood by the tenderer including the clients needs and the needs of the project.

3. A comprehensive scoring guideline for the 'methodology' attribute is presented for implementation into the CPP. It includes the provision of a detailed work plan that will enable the evaluation team to determine if the tenderer has an understanding of the problem, has identified and considered all necessary tasks to give the required result, and has used suitable methodologies. Because of the difficulties in evaluating superior methodology and innovation at the proposal stage, scoring of this criteria should include the consideration of performance in past projects.

4. To ensure that the tendering authorities do not use a narrow definition for evaluating the quality attribute 'relevant experience', a greater emphasis should be placed on the comments made in the CPP guidelines regarding the evaluation of new companies. When evaluating the relevant experience of new companies, the experience of the individual personal must be considered, and where a low level of technology is required, for the project that other experience be considered.

5. To ensure that the quality attribute 'management skills' is accurately evaluated, the RFT should require detailed information demonstrating the quality management systems of the tenderer's organisation, and how the quality processes and controls will be applied to the project in question. To assist in the evaluation of the management personnel proposed by the tenderer, it is recommended that the past performance of the proposed individuals be considered.

6. To assist the evaluation team in determining the technical skills required for the project, the tenderer should identify the tasks from the project plan that the individual person will be assigned. Scoring may be weighted depending on the level of skill required to achieve a task, to ensure the tenderer is not scored on skills that are not necessary for the project. Consideration should be given to the tenderer's past performance in providing skilled staff, including the key personnel previously agreed to in the tender.

7. To improve the evaluation procedure of the quality attribute 'track record' under CPP, more relevant information should be attained. To gain more information, a formal

performance evaluation procedure should be developed and implemented into CPP. Information gained from the performance evaluation should be recorded and used in the evaluation of the tenderer's track record for future contracts.

8. Interviewing should be encouraged during the evaluation of the CPP. Interviewing will provide the client with an opportunity for questioning the tenderer on the quality attribute details presented in the proposals. The combination of written and face-to-face communication provides the evaluation team with substantially more information to base their evaluation on.

9. A performance evaluation procedure was developed in chapter 4 of this report, for the implementation into the CPP for professional services. The recommended procedure consists of a performance evaluation form which evaluates the consultants non-price attributes: methodology, management skills , technical skills and track record, at the completion of a project. As part of the evaluation of the consultant's track record, a plan quality evaluation form was developed and is to be completed by the prime contractor.

10. Future research into effective communication processes for professional engineering is needed to further improve the relationship between the client and consultant. It is important that the future communication processes help form relationships that are close, open, and mutually beneficial to both parties.

CPP is providing an improved contract management environment that is intended to enhance the efficiency of providing an effective road transportation system. With the adoption of the recommended improvements to CPP for professional services, that objective may be better achieved.

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APPENDIX A

Sample List Of Questions For Consultant At Interview

The following is taken from a paper by DuWayne R. Kasma, 1987.

The following is a list of questions to be asked all consultants to assist the client in evaluating the capabilities of the firms.

1. What is your firm's current workload ?
2. What is the capacity of your firm to accomplish the work in the required time ?
3. How many projects have you designed like this one ?
4. If you were selected for this project, whom from your firm would be the engineer assigned to our project and what is the person's qualifications ?
5. Do you provide financial advice and analysis for project funding ?
6. What are your opinions and procedures regarding project inspections for a client with no engineering staff ?
7. How do you handle complaints during a project ?
8. How do you final a project out, and what does your final report look like?
9. How do you prefer to deal with the client and the client's staff ?
10. Do you need other consultants to assist you in this project ? Name any subconsultants.
11. What is your recommended method of charging for engineering services on this project ?
12. To what extent do you include client participation in the planning and design process ?

APPENDIX B

Sample Letter & List of Organisations Receiving Letters

Department of Civil Engineering
University of Canterbury
Private Bag 4800
Christchurch

23 November, 1995

Southland District Council
PO Box 903
INVERCARGILL

Attention: Roading Manager

Dear Madam/Sir

My name is Jodi Enright, I am currently studying towards a Masters Degree in Civil Engineering at the University of Canterbury. My chosen research project topic is Competitive Pricing Procedures (CPP) of Professional Services.

I am writing to request information on performance evaluation. Specifically regarding the procedures your authority uses for the monitoring and feedback of consultant performance. Part of my CPP research will be a review of performance monitoring procedures used by Transit New Zealand, Local Authorities, consultants (customer satisfaction forms) and overseas transportation authorities. I appreciate that your authority may not have any formal procedures and consequently cannot respond to this request. However, if you have any personal opinion regarding this subject it would also be welcomed.

I have only recently completed the coursework component of my ME; my project report is due in February 1996, and consequently I require the performance evaluation information urgently. If you could have the information to me before Christmas it would be appreciated.

Yours faithfully,

Jodi Enright
NZCE, BE(Hons)

(email address: alexanja@cad.canterbury.ac.nz)

Sample of Local Authorities

Christchurch City Council
PO Box 237
Christchurch

Rotorua District Council
Private Bag 3029
Rotorua

Tauranga District Council
Private Bag 12022
Tauranga Mail Centre

Auckland City Council
PO Box 7107
Wellesley St, Auckland

Dunedin City Council
PO Box 5045
Moray Pl, Dunedin

Invercargill City Council
Private Bag 90104
Invercargill

Kapiti Coast District Council
Private Bag 601
Paraparaumu

Wellington City Council
PO Box 2199
Wellington

Southland District Council
PO Box 903
Invercargill

Sample of Consultants

Royds Consultancy
Dunedin

Beca Carter Holling and Ferner
Auckland

Worley Consultants
Auckland

Works Consultancy Services Ltd.
Wellington

Manukau Consultants
Manukau City

Dufill Watts & King Ltd.
Dunedin

T. H. Jenkins & Associates
Consulting Engineers Ltd
Blenheim

APPENDIX C

Examples of Local Authority Performance Evaluation Procedures

File No. _____

Christchurch City Council
WASTE MANAGEMENT UNIT — Form used in similar style by Roading Unit

CONTRACT COMPLETION DESIGN REPORT FORM

CONTRACT: _____

1 WAS THE SURVEY SATISFACTORY? Yes ☐ No ☐

Comments:

2 WERE THERE SUFFICIENT TEST BORES AND WERE THEY ACCURATE? Yes ☐ No ☐

Comments:

3 WERE SERVICES CHECKED SATISFACTORILY? Yes ☐ No ☐

Comments:

4 WERE PLANS ACCURATE AND SUFFICIENTLY DETAILED? Yes ☐ No ☐

Comments:

5 WAS THE SPECIFICATION ADEQUATE? Yes ☐ No ☐

Comments:

6 WAS THE SCHEDULE ACCURATE AND SUFFICIENTLY DETAILED? Yes ☐ No ☐

Comments:

7 WAS THERE SUFFICIENT BACKGROUND INFORMATION SUPPLIED? Yes ☐ No ☐

Comments:

8 Were changes made to the original design Yes ☐ No ☐

If so what and why:

9 Have you any other comments or suggestions Yes ☐ No ☐

Contract Officer _____

Date: _____

CONTRACT COMPLETION REPORT AND APPRAISAL OF CONSULTANT'S PERFORMANCE

Contract No._____ **For** _____

Consultant: _____

Date of Acceptance: _____ | **Completed:** _____

Accepted Tender Price: $_____ | **Final Contract Price: $**_____

Key Personnel: _____

For the purposes of this appraisal the gradings used have been allocated the following definitions:

Poor :	Unsatisfactory performance
Satisfactory :	Met expectations or requirements
Good :	Exceeded expectations or requirements
Excellent :	Greatly exceeded expectations or requirements

1. Did the professional services work commence and proceed on time? (**Yes/No**) If not, state reasons for delay.

_____

_____

_____

2. Were there any problems or delays with the execution of contract documents and confirmation of insurance cover? (**Yes/No**)

_____

_____

_____

3. Availability of key personnel when required : (**Poor / Satisfactory / Good / Excellent**)

_____

_____

_____

4. Performance of key personnel particularly Team Leader : (**Poor / Satisfactory / Good / Excellent**)

_____

_____

_____

5. Overall co-ordination and management of the project: **(Poor / Satisfactory / Good / Excellent)**

6. Liaison with other Authorities : **(Poor / Satisfactory / Good / Excellent)**

7. Were the professional services completed within budget and contract price? **(Yes/No)** If No, give reasons:

8. Standard of Quality Assurance : **(Poor / Satisfactory / Good / Excellent)**

9. Overall performance of secondary consultants : **(Poor / Satisfactory / Good / Excellent)**

10. Was the physical works contract (if applicable) supervised by the Consultant completed on time and within the approved budget? **(Yes/No)**

11. Provide details of any conflict that had arisen with the Consultant and how this was resolved.

12. Comments on the attitude of the Consultants towards assessment of variations or claims for additional professional fees.

13. Standard of reporting/communicating/invoicing etc **(Poor / Satisfactory / Good / Excellent)**

14. Would you be happy to manage another Contract that is awarded to this Consultant? **(Yes/No)**

15. Comment, with reasons, on any aspect of the Contract documents which could have been amended / deleted etc for improved Contract performance.

16. Overall performance of the Consultant: **(Poor / Satisfactory / Good / Excellent)**

Signed : _____ **Date:** _____

(Project Manager)

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CONTRACT PERFORMANCE APPRAISAL

Contract No:

Name:

Contractor:

Date Awarded:

Term:

Date of Practical Completion:

Date of Maintenance Completion:

>152

TECHNICAL SKILLS:

Comment on technical performance relevant to the project:

★ General Comment

★ Work Knowledge

★ Judgement

★ Versatility

★ Methodology

★ Attainment of Standards

★ Accuracy/Dimensional Control

★ Quality Control Measures

★ Physical Resources

1>152

MANAGEMENT SKILLS:

Comment on organisational performance relevant to the project.

★ **General Comment**

★ **Forward Programme/Planning**

★ **Organisation of Work**

★ **On-Site Supervision**

★ **Communication (with supervisor/management)**

★ **Progress Achieved (throughout project)**

★ **Processing of Directions/Variations, etc**

★ **Effect of Works on Public**

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FACTORS INFLUENCING PROJECT:

Comment on factors such as weather, availability of materials, etc. which may have impacted on the performance of the Contractor beyond his control.

OVERVIEW COMMENT:

CONTRACT SUPERVISOR: _____

DISTRICT ENGINEER: _____

PROFESSIONAL SERVICES CONTRACT NO. 1236
ROADING IMPROVEMENT PROJECTS 1995/96

SECTION 5 - PERFORMANCE MEASURES

5.1 General

The consultants performance under this professional services contract will be monitored and may be measured by the client. Such monitoring and measuring may extend to all of the consultants obligations under the contract. The items set out below are specific examples of issues which will be monitored by the client:

- The timeliness of the receipt of the consultants monthly report.
- The timeliness of receipt of the consultants fortnightly report.
- The timeliness of the receipt of the consultants programme for the contract and updates thereof.
- The consultants achievement of programme deadlines.
- The timeliness and adequacy of the documentation of the preliminary, design and construction phases of work.
- The percentage variation between the final contract price and the accepted tender price of physical works.
- The timeliness and adequacy of the consultants budget management advice on physical works contracts.
- The incidence of avoidable site problems (ref Clause 2.19).

5.2 Performance Reviews

The client may review the consultants performance against the requirements of this document at any time. The outcome of these reviews shall be communicated to the consultant in writing and the consultant shall have the right to respond.

APPENDIX D

Examples of Consultants 'Customer Review' Forms

CLIENT PROJECT FEEDBACK

PROJECT:

Works Consultancy Services is committted to providing you with:

- a service which meets or exceeds your expectations
- projects delivered on time and within budget
- a high level of project management
- value for money

We wish to continue to improve our service and would appreciate your assessment of how well we:

		Assessment *(circle rating)*								
		Poor			Reasonable			Excellent		
1.	complied with your brief	1	2	3	4	5	6	7	8	9
2.	satisfied the technical aspects of the work	1	2	3	4	5	6	7	8	9
3.	responded to your needs	1	2	3	4	5	6	7	8	9
4.	communicated with you	1	2	3	4	5	6	7	8	9
5.	managed changes to the brief	1	2	3	4	5	6	7	8	9
6.	provided a timely service	1	2	3	4	5	6	7	8	9
7.	provided a service to budget	1	2	3	4	5	6	7	8	9
8.	provided informative progress reports	1	2	3	4	5	6	7	8	9
9.	provided clear invoices	1	2	3	4	5	6	7	8	9

Other comment:

Would you use Works Consultancy Services again? *(Tick box)*

Yes		No		Maybe	

Completed by:	Company:	Date:

A stamped addressed envelope is enclosed

WORKS Consultancy Services

MANUKAU CONSULTANTS LIMITED

CLIENT REVIEW

Manukau Consultants Ltd has an ISO 9001 Quality System part of which is designed to help us to improve the quality of service to meet and exceed our clients' needs.

Client review of projects is a measure of the quality of service and Manukau Consultants Ltd would appreciate your review. Please complete the client assessment by ticking the selected box below then forward to the General Manager, Manukau Consultants Ltd, (fold and staple - already addressed)

Project . . . . . MC# . . . . . .

Project Status: in progress / completed

Original Deadline . . . . . Original Budget . . . . . .

Agreed Deadline . . . . . Agreed Revised Budget . . . . . .

Rating of Service	Service Level	Clients Assessment tick box ✓	to be completed by MCL
Quality of Service	Achieved or exceeded standard	☐	
	Below Standard	☐	
Timeliness of Service	On time or ahead of time	☐	
	Behind Time agreed	☐	
Value of Service	As agreed or revised fee	☐	
	Above agreed or revised fee	☐	
Communication With Client	Adequate or better	☐	
	None or inadequate	☐	
Professional Relationship	Adequate or better	☐	
	Not Adequate	☐	

Did the service :

a) Exceed your expectations ☐

b) Meet your expectations ☐

c) Not meet your expectations ☐

Any comments regarding the service _____

_____

_____

Signed by Client _____ Date _____

APPENDIX E

Examples of Overseas Performance Evaluation Forms

The following is taken from a paper by DuWayne R. Kasma, 1987.

CONSULTANT PERFORMANCE RATING FACTORS

(PROJECT NAME)

_____

Name of Consultant

Criteria	Rating Point (10 highest, 1 lowest)
1. Completed project on time	_____
2. Actual construction cost as compared to firm's estimated (if applicable)	_____
3. Number of construction cost change orders. (if applicable)	_____
4. Consultant fees required as compared to original contract amount	_____
5. Key personnel continuity throughout project	_____
6. Client complaints resolved promptly (if applicable)	_____
7. Presentation method at meetings	_____
8. As-built drawings provided (if applicable)	_____
9. Are user personnel satisfied with project ?	_____
10. Prompt attention to warranty discrepancies	_____
11. Permitting with applicable agencies	_____

The following is taken from a paperby J. S. Russell and G. D.Severson, 1992.

SAMPLE EVALUATION FORM

PART I -- Checklist

Were the plans complete?
_____ Very complete _____ Generally complete _____ Several omissions _____ Many omissions

Could you easily stake the project from the plans?
_____ No problems _____ Few problems _____Some problems _____ Serious problems

Were the quantities correct?
_____ Correct _____ Some errors _____ Several errors _____ Large errors

Was the drafting of – _____ Excellent _____ Good _____ Fair or _____ Poor quality?

Was the plan accuracy – _____ Excellent _____ Good _____ Fair or _____ Poor?

Did the plans contain – _____ Few _____ Several _____ Many or _____ Serious errors?

Were the plans – _____ Very easy _____ Easy _____ Difficult _____ Very difficult to read?

If the Designer or Consultant was called on to make changes, was the response –
_____ Effective _____ Slow _____ Poor or _____ Ineffective?

Would you rate this Designer or Consultant's plans –
_____ Better _____ About the same or _____ Inferior to other Consultant designed plans?

Would you rate this Designer or Consultant's plans –
_____ Better _____ About the same or _____ Inferior to other Department of Transportation designed plans?

If the Designer or Consultant produced similar plans, would you recommend that the Designer or Consultant be –
_____ Used again _____ Given work ahead of other consultants
_____ Never given more work or _____ Given a penalty?

(continued on next page)

PART II -- Short Answer Questions

Roadway

Were the quantity summaries correct? State any major departure from plans quantity and reason for same.

Were there any problems in location in the field? If so, state problems.

Was right of way detailed properly?

State any other facts that may have presented problems relative to plans.

Were incidental items (i.e., embankment curbs, down drains, catch basins, etc.) properly located?

Earthwork

Was soil profile reasonably accurate as to type of material encountered?

Structures

Were dimensions, details, and elevations accurate?

Were any Change Orders required? Explain the purpose and the need.

In your opinion, what could have been done to improve the structure plans?

Traffic and Signing

Were the traffic and signing plans complete and accurate?

Was the detour striping plan clear and accurate?

Were there any problems associated with the temporary concrete barriers?

Were there any problems encountered with installing delineators? Were the delineator quantities reasonably correct?

Special Provisions: Bidding Schedule

Although the special provisions supersede the plans, were there any apparent contradictions between them?

Were there any items normally specifically paid for but left out of the bidding schedule?

Were there any ambiguities within the special provisions?

What might have been done to improve the special provision?

Were any change orders necessary that resulted from errors, omissions, or ambiguities in the plans, special provisions, and bidding schedule? Explain briefly.

PART III -- Additional Comments

This section is for written comments related to difficulties encountered that require further elaboration.

Province of British Columbia | Ministry of Transportation and Highways

R.I.S.P PERFORMANCE EVALUATION FOR CONTRACTED ENGINEERING SERVICES

*** REFER TO REVERSE FOR ADDITIONAL INFORMATION ***

RISP NUMBER _____ CONTRACT NUMBER _____

PROJECT NAME _____

COMPANY NAME _____

ASSIGNMENT DESCRIPTION _____

RISP CATEGORY CODES _____ BUSINESS UNIT _____

TIME	COST
SCHEDULED COMPLETION DATE: (Y/M/D) _____	ORIGINAL CONTRACT VALUE $ _____
ACTUAL COMPLETION DATE: (Y/M/D) _____	ACTUAL ASSIGNMENT COST $ _____

SCOPE CHANGES (INCLUDE EXTRA TIME AND COST REQUIRED)

_____

_____

_____

_____

attach additional sheet if necessary.

1. EFFECTIVE USE OF STAFF — RATING

Yes	No	
☐	☐	Did the assigned staff perform effectively?
☐	☐	Were the personnel listed in the proposal, or approved substitutes used, as intended?

2. EFFECTIVE USE OF TIME — RATING

Yes	No	
☐	☐	Were the contract milestone dates met?
☐	☐	Was the consultant responsible for any delays?

3. EFFECTIVE USE OF COMMUNICATION — RATING

Yes	No	
☐	☐	Was the level of communication with the Min. appropriate?
☐	☐	Was communication initiated and followed through with other agencies?
☐	☐	Was contact with the public handled appropriately?
☐	☐	Were progress reports submitted on time and without prompting?

4. EFFECTIVENESS OF METHODOLOGY AND RECOMMENDATIONS — RATING

Yes	No	
☐	☐	Was the consultant's methodology effective?
☐	☐	Were the results practical and economical?
☐	☐	Were solutions creative?
☐	☐	Was the work carried out as originally agreed?

5. EFFECTIVE FINANCIAL ADMINISTRATION — RATING

Yes	No	
☐	☐	Was approval obtained in advance for all extra work?
☐	☐	Were invoices clear & correct?
☐	☐	Were disbursements reasonable (if applicable)?

6. ACCURACY OF OUTPUT — RATING

Yes	No	
☐	☐	Did the results clearly and concisely address the terms of reference?
☐	☐	Were the deliverables complete and free from errors?

7. OVERALL PERFORMANCE RATING — RATING

Summary project rating (one-half points acceptable)

KEY

4	EXCELLENT	2	ADEQUATE		
3	GOOD	1	POOR	0	UNACCEPTABLE

COMMENTS _____

_____

_____

attach additional sheet if necessary.

EVALUATION BY: _____ POSITION: _____

Evaluator Signature *Business Unit Manager Signature*

CONSULTANT COMMENTS

_____

_____

_____

attach additional sheet if necessary.

Name / Title *Signature* *Date*